

Recontouring a Golf Green Without Total Reconstruction

Two case studies on how to change severely sloped greens.

BY DEAN GRAVES AND TIM KENNELLY

As green speeds have gotten faster, many greens with severe contours and slopes have more limited areas for hole locations. "This green is unfair" is often mumbled by the average golfer who may experience the frustration of putting on such a green.

The simple answer is to rebuild the green complex, change the green, make it bigger, flatten out the contours, and soften the slopes causing the problem. While this option may solve the problem, it can create others. Reconstruction also is the most expensive option. For these reasons, most courses tend to live with their difficult greens and dismiss their golfers' frustrations.

The purpose of this article is to show how two golf courses in the same geographic region solved their individual green contour problems.

The inspiration for this concept of putting green recontouring comes from Rick Christian, golf course superintendent at Pine Valley Golf Club in New Jersey. Working with architect Tom Fazio, the staff carefully lifted the sod and added a compatible soil to raise and soften the green contours without noticeably changing the character or feel of these greens.

CASE STUDY #1: BALTIMORE COUNTRY CLUB, EAST COURSE

In the fall of 2001, Baltimore Country Club (Baltimore, Maryland) hired golf course architect Keith Foster to provide a master plan for the East Course,



To begin the recontouring project, Baltimore Country Club (Maryland) stripped and folded the sod prior to removing it from the 12th green.

designed in 1926 by A. W. Tillinghast. Through a series of meetings with course officials, Mr. Foster made a number of recommendations, taking into account the character of the 1920s Tillinghast design. While there were numerous recommendations provided in the overall master plan, the decision to soften the slopes on greens 3, 9, and 12 would have the most impact.

THE PROBLEM

The clay-based push-up greens had a great deal of pitch from back to front for surface drainage. Through the years, the golf course was relatively unchanged except for a green regrassing program in 1993. At the time of this regrassing, the greens were enlarged and expanded to their original sizes and shapes.

Today, with the demand for greater speeds, the greens in question had very few hole locations when Stimpmeter readings were consistently above 10

feet. In fact, there were only two hole positions for the #9 green (4,600 sq. ft.) and three hole positions for the #3 green (5,700 sq. ft.) and #12 green (7,700 sq. ft.). Because of the putting speeds common today, the membership found these greens frustrating to play. The grounds staff were equally frustrated with so much traffic concentrated in too few areas on the greens.

THE PROCESS

To obtain an idea of the scope of work needed, Golftech, Inc. (Canton, Ohio), was hired to provide a contour and slope analysis map of each green. The slope analysis maps provided key information about the relationship between slopes and total square footage for usable hole locations. These greens were very pitched and in many locations had slopes in excess of 8%. We found our best hole locations for these greens were at nearly 5% slope.

With this information, Mr. Foster presented a plan in which additional hole location areas could be gained through slight softening or reduction of the slopes. The objective was to complete the work without compromising the original character of the design to attempt to complete the job so that the average golfer would find it difficult to tell that work had been done.

RESTORATION/ ENHANCEMENT PROCESS

In October, 2002, the work began. The existing Pennlinks sod was removed and

set aside in close proximity to the green. Two to four inches of the existing rootzone mix was removed, cleaned of organic matter, and stockpiled in close proximity to the green for reuse. On the 12th green, the soil removed by lowering the back of the green was to be used to raise the front of the green. The soil subgrades were either raised with the on-site material (in some cases 9 to 14 inches in the front of the green) or lowered (up to 4 inches at the back of each green) to achieve the goal of softening the severe green slopes.

Mr. Foster was on-site most of the time, and following the approval of the new subgrade contours, the rootzone mix was reinstalled and the surfaces compacted. Where additional mix was added, the soil was thoroughly tested. Based upon numerous physical soil property tests done at an A2LA-accredited laboratory, and working with our soil supplier, a compatible soil was developed.

Prior to the reinstallation of the sod, the final grade was compacted again. Compacting the soil to reduce settling was a critically important step in the recontouring process.

AFTERCARE/MAINTENANCE PLAN

Soon after each green was completed, the putting surface was extensively aerated using shallow, solid tines and rolled. One unanticipated setback we experienced was the one factor we could not control, the weather. Following the 2002 summer drought, it started to rain and it didn't seem to quit.

Because of a cool, wet fall and record amounts of winter precipitation, the greens had little rooting and remained very wet. In December, each green was covered with Wintergreen, a non-woven fabric, to increase soil and surface temperatures. On December 9, 2002, there was a 9-inch snowfall, and these surfaces were not seen again until mid-March, 2003.

Once the covers were removed, an intensive management program

began. When conditions allowed, greens were frequently rolled to smooth the surfaces. Deep-tine aeration and the drill-and-fill technique aided drainage through the soil profile. Shallow, solid-tine aeration improved turf rooting into the soil. In between, numerous applications of straight sand top-dressing were made to smooth the surfaces.



Sod from the green was cut at a depth of ½ inch and placed on plastic adjacent to the green. The Chevy Chase Club maintenance staff carefully numbered each sod strip so that it could be relaid in the same location when the recontouring was completed.

CONCLUSION

On May 1, 2003, the greens were opened for limited play while topdressing, aeration, and drainage installation efforts continued. Although the method described does not follow today's new construction methods, the goals of the club have been met. Through great teamwork, we carefully recontoured our most severely sloped greens without changing their character.

CASE STUDY #2: THE RECONTOURING OF THE 11TH GREEN AT THE CHEVY CHASE CLUB

On September 25, 1895, the first six holes opened at The Chevy Chase Club at its present location in Maryland, one-half mile outside of Washington, D.C. This opening was followed by a three-hole expansion in 1896, and a nine-hole addition in 1898 brought it to a full 18 holes. In 1915, Donald Ross completed the new 18-hole course

layout. Further changes were made by the design team of Alison, Colt, and Mackenzie, and the course was re-opened for play in 1923. In 1998, a master plan was implemented by Mr. Arthur Hills. His approach was to research old photographs to restore the golf course to its original intent of shot-making and play while rebuilding the greens to modern sand-based

specifications and adding a practice range.

At the time of reconstruction and restoration, the greens were built using a modified sand greensmix while maintaining the construction method of the perched water table and internal drainage. The green surfaces were sodded to washed *Agrostis palustris* Crenshaw sod. The vast majority of the green surfaces were built to exactly replicate the existing greens prior to reconstruction. The general characteristic of the greens is to slope from back to front, and several greens have severe contours. The new greens average 6,800 square feet with generous hole locations. This makes for interesting putting, especially when you consider the average daily green speed is now 10 to 11 feet as measured by the Stimpmeter.

THE PROBLEM

The 11th green was a medium-length, uphill par-4 with a very severe slope in

the front two-thirds of the green. The hole could only be placed along the back of the green. Holes placed on the front of the green resulted in balls rolling off the green and onto the approach. The limited hole locations made for redundant approach shots to an otherwise splendid hole. After lengthy discussions with the Green and Golf Committees and Mr. Hills, the decision

Forester and Associates, was used as the consulting architect, and Jim Wachter of the Watchmen Group, Inc., was employed to do the earthwork and contouring. The Chevy Chase staff completed the final grading and sod work.

The sod from the green was cut at a depth of $\frac{1}{2}$ inch and placed on plastic outside the area of disturbance, but near

separating the construction mix from the native soil.

Once the final contour and outline of the putting green addition were achieved, accurate grade stakes were positioned in the green cavity. Additional construction mix was delivered and equally incorporated with the recycled excavated greensmix. Great detail was given to this calculation due to the importance of producing a homogenous mix in the new area that was similar to what existed in the non-disturbed part of the old green. Even with a confident calculation of mix volume, an additional ten percent was added for peace of mind.

PREPARING THE GREEN SURROUNDS

To soften the contour of the green, the new section was ultimately raised 18 inches above the original green grade. This necessitated changing the front of the green complex. Transforming the old subsurface drainage system was managed by adding additional gravel that was compatible with the original construction mix and gravel. Only minor drainpipe alterations were required to accommodate the additional surface area. The subsurface drainage was completed, additional soil was imported to raise the approach to match the elevation of the new green surface, and the cavity was now ready for the construction mix.

COMPLETING THE GREEN

The placement of the new mix was the reverse of the removal process. The mix was delivered to the green cavity via small dumptruck loads and spread with the mini-excavator. Great detail was employed to keep the integrity of the internal piping intact and the gravel layer undisturbed. The mini-excavator only journeyed onto the gravel blanket area when there was a full 12-inch complement of mix over the stone. Once the cavity was filled and the mix contour matched the intended grade, the grading stakes were removed. A

A mini-excavator was used in the Chevy Chase project to remove the appropriate amount of mix without disturbing the gravel layer and construction mix.



was obvious. If the front of the green was to be used, recontouring was required.

THE PROCESS

The plan was to start the recontouring project in early November, 2002, with a completion date of Thanksgiving and an opening in early April, 2003. The alterations were relatively straightforward. The front of the green would be raised 18 inches to provide new hole placements in the middle left and front of the green. The front of the green also needed to be extended forward approximately 15 feet, expanding the green surface by approximately 350 square feet. The approach and rough areas also had to be redone to accommodate the new grades and a larger green.

Sod was utilized from the existing green, and the remaining amount was purchased from a reputable grower. Arthur Hills, of Arthur Hills/Steve

the 11th green. We felt it was of paramount importance to have the sod re-laid back on the green in exactly the same location. To accomplish this, each sod strip was removed, numbered, and placed on plastic near the green.

Next, the existing construction mix was removed and placed on a nearby paved area. This topmix was eventually mixed with additional compatible sand to compensate for any losses and the additional putting area to be added.

The subsurface gravel and drain lines were not disturbed. A mini-excavator was positioned on the mix as the material was removed from the cavity. This enabled the mini-excavator to remove the desired amount of mix without disturbing the gravel and construction mix with its tracks. To complete this step, the thin interface layer of contaminated sand and gravel was manually removed and discarded. The additional green area was excavated and outlined with a plastic wicking barrier,

bunker rake repeatedly tracked the mix to firm the surface. Once this was accomplished, a vibratory plate tamper was run over the mix numerous times in several directions. After the required grade was met, several predetermined soil amendments were incorporated into the mix with the bunker rake. Again, the plate tamper was used across the mix to establish the final grade. Surface grades were checked to make sure additional hole locations were established and surface drainage was adequate.

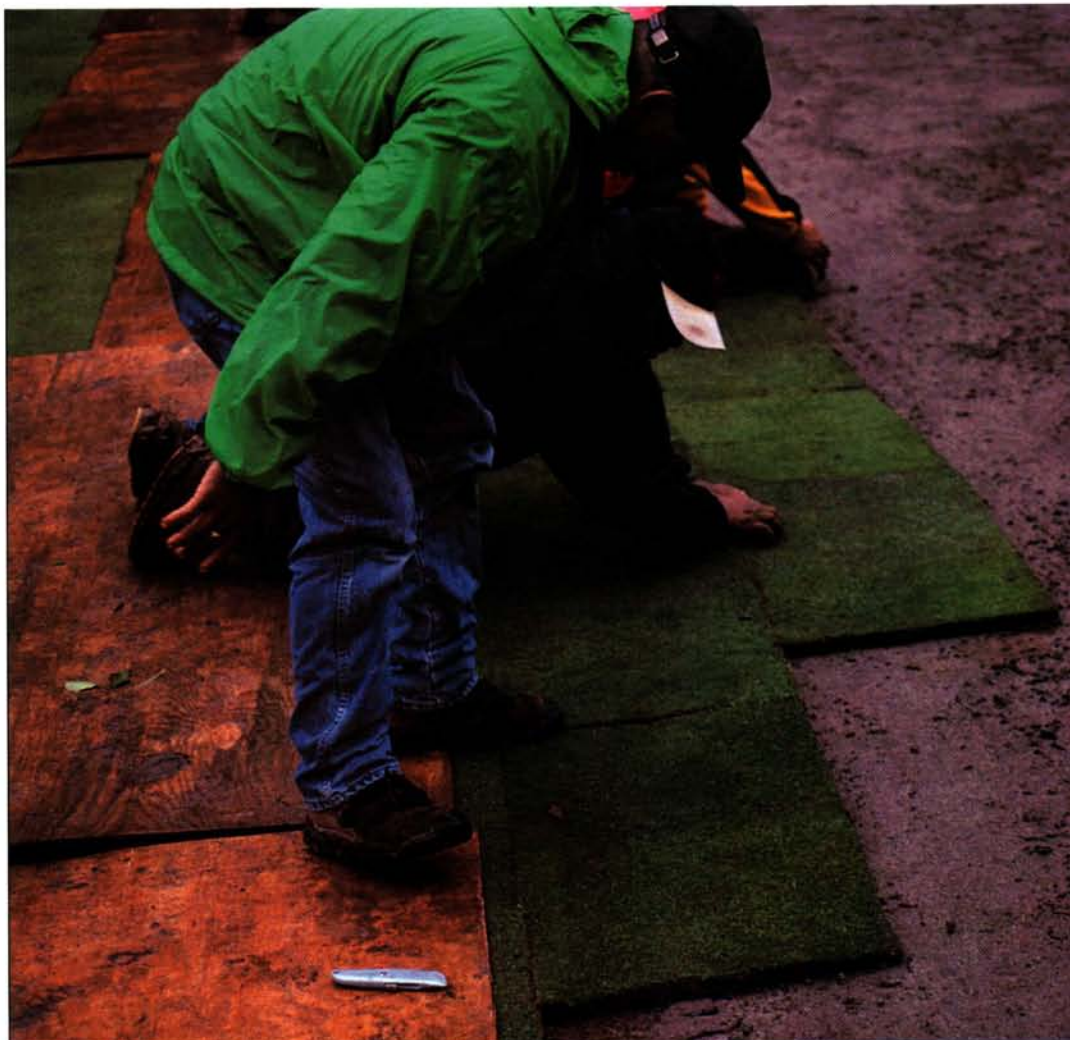
Once this was achieved and the elevations of the mix minus the thickness of the sod were met, resodding commenced. Great care was made to assure there was no scalping or interrupted transition between the surfaces. The transition between the new green and the original green needed to be seamless and unnoticeable to the golfers.

There was apprehension as the first pieces of sod were laid, but the sod installation went without a hitch. Efforts were made to keep the sod from being stretched during placement because of the natural tendency of sod to shrink. The seams were topdressed to assure smoothness and rapid knitting between the sod pieces.

Once completed, turf blankets were immediately installed after an initial drenching of irrigation water and application of a soluble starter fertilizer. A blanket of snow covered the Washington, D.C., area for the winter. Essentially, the green stayed in this state because of the hard winter.

When the snow finally melted and the ground thawed enough to pull the sod staples, the cover was removed. Disappointingly, there was no root growth due to the continually frozen soil, and some minor settling had occurred. A light topdressing was applied and the cover reinstalled. Thankfully, within two weeks the roots leapt from the sod into the greensmix.

Mowing commenced as soon as the sod rooted and tacked down enough to



With the project complete, the final grade was compacted to minimize settling prior to the reinstallation of the sod.

assure putting surface stability. Some pockets of settling did persist even after numerous topdressings and light rollings. Since the sand couldn't be compacted, a 2,000-pound roller was used to smooth the green. This process worked so well that plywood did not have to be laid on the green surface to cushion the roller. The roller was used in different directions, and the result was a very smooth surface.

The green opened for play on April 15, 2003, to membership approval. This project was a success and amounted to constructing a new green, but on a much smaller scale.

CONCLUSIONS

Fast greens will continue to present maintenance and playability headaches.

In reality, most older golf courses share the same problem; most have one or more greens that were designed and constructed during times when the standard mowing height was $\frac{1}{4}$ inch. Today, new and old greens are cut at $\frac{1}{8}$ inch, and sometimes less. Greens designed for the slower speeds of yesterday can have limited hole locations and be frustrating to play and maintain under today's conditions.

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