Members and guests of Valley Country Club have a spectacular view of the Rocky Mountains.

Drainage Project Helps Revitalize Country Club

Country clubs have been the private parks of millions of American golfers and their families for more than a century. They have provided members with an exclusive life-style filled with amenities, including golf, tennis, swimming, sports instruction, and dining. Membership has always been a privilege, causing many to wait for years and pay tens of thousands of dollars to join.

But the country club life is now being threatened in some areas by depressed economies, shrinking water supplies, and competition from real estate development courses and improving municipal courses. Not all country clubs have waiting lists today. They have to compete for members.

Valley Country Club in Aurora, CO, is a perfect example of a middle-aged country club that has successfully fought to remain competitive. Located southeast of Denver, the club has survived all the challenges listed above by evolving with technology to meet its members' needs.

Despite a sluggish economy since 1984, the 560 members of Valley Country Club have invested millions of dollars in the personnel, equipment, and course improvements necessary to stay competitive. While other courses in the Denver area are perilously close to financial disaster, Valley is healthy and gaining in quality. However, it hasn't been easy.

Golf Course Architect William F. Bell laid out the 6,800-yard course on 165 acres of rolling prairie southeast of Denver in 1955. The site was spectacular for two reasons. First is a magnificent view of the Rocky Mountains. The other is Cherry Creek, which runs through the middle of the property. Melting snow from the Rockies over millions of years carved a wide path through the valley's clay soil and deposited a deep layer of sand. Wells drilled into this alluvial pocket supplied the valley with a seemingly endless amount of water.

Half of the property is located in the floodplain of the creek, while the other half rests on its rolling banks. Bell located the front nine and the clubhouse on the bank overlooking the creek. He placed the back nine in the floodplain, relying on the fact that serious floods occurred only once every 100 years. Nevertheless, he elevated the tees and greens on the back just in case.

To this diverse topography, Bell added doglegs, tight fairways, bunkers, and tall rough to create a challenging yet very enjoyable course to play. Bunkers were positioned near every green and between 150 and 200 yards from the tee on par fours and fives. The former ranchland had few trees for Bell to incorporate into his design.

With Valley Country Club, he was taking golfers a step beyond park-type courses, where much of the rough is in play. He rewarded placement equally to distance on every shot. His approach was to encourage golfers to improve their skills gradually, rather than overwhelm them with hazards or distance.

The course grew tougher over the next 25 years with the addition of more than 2,000 trees and eight lakes. As the trees matured and the lakes were built, the course became tighter and more challenging. Today water comes into play today on all but four holes. Few members finish their rounds without the disheartening sound of a ball splashing into water or ricocheting off a tree. Time and enhancements to Bell's design have given Valley Country Club the distinction of being one of the top four courses in the state.

As the course became more challenging to play, it also became harder to maintain. Serious floods devastated the back nine far more frequently than the expected 100 years. Not only did they force the club to close and repair the course often, they left behind thick layers of silt over the sandy soil.

Strangled by the silt, the Kentucky bluegrass on those fairways could no longer recover from the traffic of players, carts, and maintenance equipment. The problem was compounded by a water table that remained near the surface for much of the year and a quick-coupler irrigation system that was difficult to manage. Annual bluegrass invaded the damp, compacted fairways in the spring and fall, but withered during the summer. Battling the symptoms of poor drainage and root growth became a full-time job for the superintendent.

For 14 years, superintendent Jim McPhilomy struggled to keep the course in shape. He converted the irrigation system to automatic control, experimented with different types of drainage products, and initiated a soil study. He implemented a program of aeration and sand topdressing in addition to overseeding the fairways with perennial ryegrasses. He added lakes to the back nine in the late '70s, when two consecutive years of drought hit the region. Treating the symptoms of poor drainage was a constant battle.

Finally, club authorities approved construction of an earthen dike along the creek. It held the spring floods at bay, but did nothing to rid the course of accumulated rainfall. Sump pumps had to be used to remove standing water trapped on the surface. After the surface water was gone, a high water table remained much of the year.

The problem was so acute that even without heavy rains, normal irrigation often presented drainage problems. Low sections of fairways and approaches were constantly soft and mucky. Carts were restricted from these areas and diseases attacked the turf, leaving it open to encroachment by broadleaf weeds and annual bluegrass. The condition of Valley Country Club was unquestionably slipping.

Soil tests conducted by Dick Psolla of Brookside Farms Lab Association revealed that toxic levels of salts were accumulating in the soil. The turf, trees, and shrubs were absorbing large amounts of sodium and declining as a result. Psolla concluded that increasing salt levels and decreasing soil oxidation had to be corrected and a drainage system installed.

One option was to continue to treat the symptoms of poor drainage and install cart paths in the worst fairways. The other was to install drainage and forgo building the cart paths. The club also wanted to update its irrigation system. All of these would require a membership assessment to raise the funds.

In 1986, Valley was at a critical point in its history. The economy in Denver had turned sour. The municipal water district had informed the club that its supply of well water would be greatly curtailed in the next few years. Any way they looked at it, costly improvements were needed, yet the timing was terrible for an assessment. In the midst of all this, the club lost both its general manager and superintendent.

However, its luck was about to change. First it hired Manfred Baker, who had been general manager of the 5,000-member Mount Vernon Country Club. He had to appease both the golfing and nongolfing membership. The board was willing to support a plan to improve both the course and the clubhouse, even if it meant an assessment.

Baker reviewed previous proposals by McPhilomy and Psolla to gain an understanding of the course's condition and drainage problem. He then started looking for a superintendent who could do much of the renovation work in-house. Psolla provided Baker with a list of superintendents in the area who had construction experience. One of them was Gary Grandstaff.

Earthen dike holds back Cherry Creek during flood.

Had the economy not been in such bad shape, Grandstaff would have been busy designing and building golf courses. He had worked for Pete and Roy Dye for 12 years as well as a golf course construction company. The Penn State turf graduate had a number of redesigns to his credit and considered himself as much an architect as a superintendent.

Grandstaff still had to beat out three other strong candidates. His familiarity with drainage and effluent irrigation gave him the edge he needed. But Valley Country Club got a bonus. Grandstaff put together a five-year plan, not just something to correct the drainage and irrigation problems, but an overall redesign of the course. He recommended relocating tees and traps, reshaping the greens, and moving dozens of trees.

"In the past, the club had tried to make changes piecemeal," Grandstaff points out. "They'd correct one hole at a time and then go through the approval process again for the next hole. If the board changed, you had to reexplain what you were doing to win the support of new board members. The five-year plan tied the whole project together so an overall budget could be established."

To settle any fears of the membership, Grandstaff first wanted to demonstrate to the members the effectiveness of renovation. He submitted a proposal to the grounds committee for installation of drainage and received approval. The club's maintenance staff began the project in the spring of 1987.

During the course of installation, Grandstaff was forced to divert his efforts to treating symptoms of poor drainage, including topdressing, reseeding, resodding, deep tine aeration, and applying fungicides and herbicides. By July, only the approach to the 12th green had received new drainage. When a three-inch downpour forced closure of the course on the normally busy Fourth of July weekend, it became clear that an outside contractor was needed to complete the work as soon as possible.

Grandstaff sought proposals from local contractors, suppliers, and manufacturers. He was looking for a way to solve localized drainage problems with the least disruption to play. He also wanted to lower the water table on the back nine.

A proposal by Don Clark of D. Edward Clark & Associates of Sheridan, CO, impressed Grandstaff. Clark recommended using a large amount of narrow, vertical drainpipe. The pipe could be installed in trenches less than two inches wide and as deep as 18 inches with a wheel trencher he had adapted for the purpose.

Ironically, Clark's and Grandstaff's experience with drainage did not come from problems created by old course designs. Instead, they had both devoted

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Sump pumps were used frequently to remove surface water from low spots before drainage was installed.

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much of their time to adapting irrigation and drainage systems to fit the modern designs of Pete Dye, Arnold Palmer and Jack Nicklaus.

Clark had been a designer and installation consultant for a Denver irrigation distributor before starting his own irrigation and drainage firm. It had been his job to solve some of the drainage problems presented by the spectacular creations of big-name architects.

To determine the appropriate routing and depth for flow in areas with little or no fall, Clark surveyed the holes with a transit. Since the course had no as-builts for either the irrigation or drainage, Grandstaff and Clark were at a disadvantage. A layout was completed for the four holes with the most drainage problems: numbers 10, 11, 12, and 17.

Before work began in September, Clark put together an article detailing the proposed drainage work for the club's monthly newsletter. It explained temporary course adjustments, playing suggestions, and the signs that would be used to mark construction areas. Clark went so far as to build a box to demonstrate to the grounds committee how the drainage material worked.

He concentrated his labor force in only one section at any given time. As the trenches were dug, the drainage materials were installed, backfilled with a combination of coarse and fine sand, seeded, and the surface cleaned up. By working out from the main drainlines, each new section was operational by the end of the workday. Catch basins were installed in low spots to catch runoff from storms or irrigation. All trenches were topdressed regularly as they settled.

In two months, nearly 8,500 lineal feet of drainpipe had been installed on the four holes. Grandstaff also aerated the back nine four times that fall to break up the layer of silt, which varied from two to ten inches in depth. "On the first pass the tines only penetrated an inch," said Grandstaff. "By the fourth pass, they were easily going down six inches." The crew now uses an Aerway for the fairways and a VertiDrain for the greens for periodic, deep aeration.

Observation of the course during the winter proved the immediate value of the drainage system and aeration. Playability was noticeably better than that on holes without the drains.

The following spring, Grandstaff took core samples every few days to judge soil moisture and depth. Despite two three-inch rainstorms, the water table stayed beneath the depth of the pipe. The soil was not saturated as it had been in previous springs, but it stayed near field capacity. "Between April and June, the tenth fairway received a total of ten minutes of irrigation," Grandstaff remarked. "The capillary movement of water in the soil and deeper roots generated

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Clark's crew installed more than 8,000 feet of vertical drainpipe in less than two months.

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by the turf over the winter were sufficient for growth."

Tests conducted by Psolla that fall after one summer's irrigation revealed a dramatic improvement in soil conditions. The pH had dropped almost half a point to 7.4. The organic matter doubled with a corresponding increase in exchange capacity. Accumulated salts fell by more than 30 percent having been leached through the soil.

"It was the first time in years that members had good turf on the back nine," said Grandstaff. "Even the Poa looked better and made it through the summer in good shape. We started spending less time putting out fires and more time on redesign work. We moved 60 trees and started relocating traps and reshaping greens. The course was definitely turning around, and the members were loving it!"

Baker and Grandstaff had earned the confidence of the membership. The members rewarded them by approving assessments for the course redesign project, a new irrigation system, improving the clubhouse, and creating a reservoir to convert to effluent irrigation. Despite a poor local economy, Valley Country Club was spending nearly $4-million!

Clark got the go-ahead for another 20,000 feet of drainage. "I was surprised in a way that the club opted to improve its drainage system before its irrigation system," he admits. "But I also know that even the best irrigation system can't solve existing drainage problems, nor can a new drainage system solve problems with an old irrigation system. You need both to get control over water on a quality golf course."

Clark adds that new products are making drainage improvement faster, less disruptive, and more efficient. As a result, it is easier to sell to the membership of private courses. By using specialized equipment and trained crews, companies like Clark's can provide a valuable service to superintendents whose hands are full with other tasks.

Valley is once again attracting new members. It is also attracting staff. Baker's insistence on hiring experienced personnel is paying off. In 1989, when Dye asked Grandstaff to take over construction of the Pete Dye Golf Club at the Burning Embers Resort in Clarksburg, WV, he couldn't resist. Resort owner James LaRosa also promised Grandstaff he could design a second 18-hole course when he complete the Dye course. "It was just too good to pass up," says Grandstaff.

Rather than leaving Valley in the lurch, Grandstaff contacted John Hoofnagle, superintendent of grounds for the Meridian Golf Club and Denver Tech Center in nearby Englewood. "As John responsibilities grew, he was getting away from golf," explained Grandstaff. "Meridian is a Jack Nicklaus course, so John was very familiar with the challenges presented by championship designs and the irrigation systems they require."

One meeting with Baker was all it took Hoofnagle to agree to the switch. "Valley is a nice family club which has made the commitment to quality golf," states Hoofnagle. "It is providing the weapons it takes to produce that level of play."

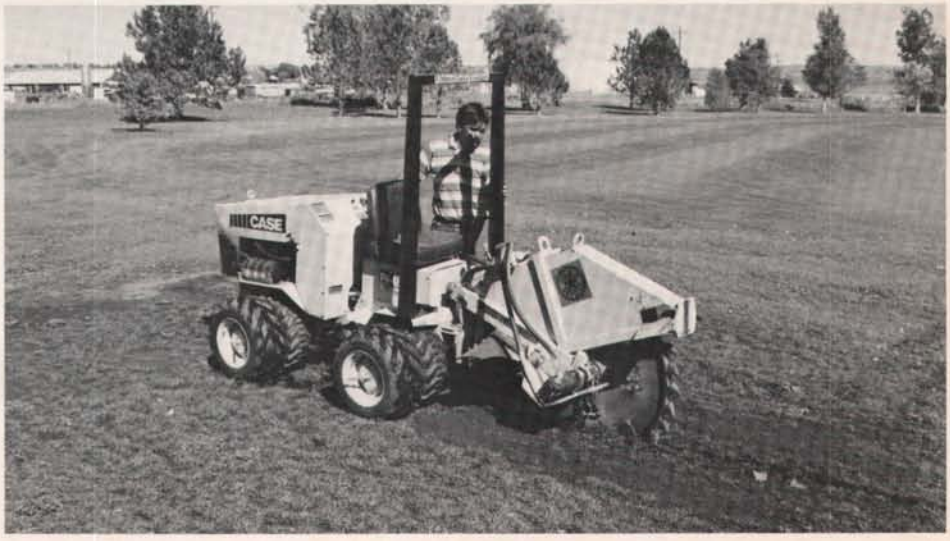
Like Grandstaff, Hoofnagle is a graduate of the Penn State turf program and familiar with golf course construction since working for five years with Golf by Al Janis in Berlin, MD. His eventual position at Meridian was proof of his grasp of design, construction, and maintenance.

"We're about halfway through the redesign of Valley," he states. The as-builts from Clark and Grandstaff's five-year plan have been essential to the design and installation of the Toro Network 8000 irrigation system. The system was designed by Rick Robbins, who impressed Baker with his work at Inverness Golf Club in Englewood. Valley Crest Landscaping is installing the system.

"By this June we'll have the whole system up and running," says Hoofnagle. "This winter we got a head start on programming the central computer. The weather station should help us cut our water use and speed up the conversion to effluent."

Baker reports that Valley is close to filling its roster of 530 golfing members. The new clubhouse sits on a ridge above the totally turfed fairways. The effluent reservoir is completed and the club is prepared to function without well water for irrigation. Almost two months have been added to the course's busy golf season.

"Valley Country Club is in good condition today," boasts Baker. "Not all clubs can say that. It's taken a lot of work by the board and the staff to get to this point. Country clubs, if they want to stay country clubs for long, can't stand still. We have to stay competitive to stay alive."



Wheel trencher adapted by Clark cuts narrow trenches up to 18 inches deep.