



Some of the earth-moving equipment and haul-road culvert used during rough grading for the Kelso course.

Some Recent and Unusual Experiences in Golf Course Design

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IT IS A RARE DAY indeed when a golf course architect finds he can actually cut construction costs, provide for lower long-term maintenance costs, and still produce a new golf course close to what he had originally in mind on his design board. Rare, but not impossible!

That's exactly what happened to the Three Rivers Golf Course, owned by the Elks Club, in Kelso, Washington, just a few years ago. I don't think there is another golf course like it.

As a golf course architect, I initially faced the problems of a low-lying, boggy site that would have been difficult to drain and would surely have had high maintenance costs and continuing problems. We wound up instead with pleasantly hilly, well-drained land (made up of a turf-growing medium that an eminent agronomist called "perfect" for a golf course), contoured just as designed, and with relatively easy maintenance.

How did this happen? Because we were able to use the ash that scattered over Washington State after Mount St. Helens erupted several years ago. We obtained the material because the Army Corps of Engineers needed a place to dump the ash to be dredged from the bottom of the Cowlitz River, which borders the golf course.

Several years earlier, we had picked that site as the best of the three available, after the Elks Club sold its original course for a shopping center, but we knew we had potential problems.

The area didn't drain well because it was in a basin adjacent to the river bank. Within that basin was a deep drain ditch with a pump system that collected and retained water from off the site. The soil promised to be troublesome because of a low percolation rate and a high water table. As if that wasn't enough, a small portion of the site, under the future 13th hole, was a former garbage dump.

Everyone connected with the site selection recognized that maintenance could be costly, but the other available locations had more serious problems, so this one was it.

THE WATERING procedures would be difficult because irrigating the higher areas that needed water would inevitably result in water reaching the already saturated lower areas. We would then have high drainage system costs, and I wasn't certain that even this would allow play throughout the year. Rainfall is particularly heavy between October and May in that region.

Our office was considering how best to proceed with the project when Mount St. Helens blew apart. A few weeks later I got a call from Fred Bader, the golf professional and manager of the old course, advising me that the Corps of Engineers wanted to pump the sediment from the Cowlitz River bottom onto the new golf course site. Later I was informed

that the ash that settled on the bottom of the Cowlitz had created a threat of flooding, which is why the Corps needed a nearby dump site quickly.

While I frantically tried to determine the quality of the material and how much there would be, the pumping started. It was a great relief to learn from Dr. Roy Gross, agronomist and turf specialist at Washington State University, that the ash was more like sand and was comparable to the material used for green construction. What we were going to have was an entire golf course with a high-quality, unusually deep soil.

When the Corps finished the pumping and the rough grading it agreed to do, our golf course site was covered with thousands of cubic yards of gray sand, in some areas to a depth of 35 feet, or as tall as a four-story building. It was leveled and contoured to my design and specifications, and you may be certain that the potential cost of maintenance was reduced substantially, because we could sculpt the course completely out of this excellent soil. We had our choice of golf course feature shapes, sizes, and gradients.

We had humps and hollows where we wanted them, with good percolation, making it easier (almost too easy) to get water and nutrients to the rootzone, and we didn't require a very expensive

drainage system. The course, which was opened two years ago, is 6,777 yards from the back tees, 6,265 yards from the middle tees, and 5,463 yards from the forward tees. We included three man-made lakes and extensive tree planting, mounding, and bunkering. The result is a course that challenges all levels of golfers.

We were fortunate with the ash from the river, but many aspects of golf course design are beyond the soils and terrain. It is always important that the architect seek solutions that will provide the lowest possible maintenance costs commensurate with the client's program and budget for golf course operations.

AT ANOTHER course in Murray, Utah, we're getting all of the fill soil from a nearby state highway construction project. The fill soil is not well suited for turf growth, so we first scraped off the existing topsoil and stockpiled it.

The site project engineers designed a system that will collect surface drainage water from the many adjacent acres of land as well as the paved freeway itself. They then directed the water onto the golf course site and through a series of retention basins, drainpipes and swales. Ultimately, it is deposited into the nearby Jordan River.

Our job is to use the basins and swales to enhance the attractiveness and playability of the course as lakes and streams. We'll put back the topsoil after the fill soil is in place.

For another golf course, in Santa Clara, California, we're building on top of a sanitary landfill, where we must import all of the soil to be used for the cap that seals the site. You can imagine that a cap of soil selected and placed to prevent water from draining through is not the best material to grow grass on. So, on top of this cap we will place topsoil.

But whether reusing topsoil or having it hauled in, it is both possible and advisable for the golf course architect to plan for course maintenance so that this cost can be minimized and the work easily done. In all three of these diverse situations, our major effort was to assure we had the best possible medium for turfgrass growth. Since the ultimate cost of maintenance was a serious concern, we created golf course features with shapes, sizes, and gradients that allow cost-effective maintenance procedures.

That, in my judgement, is as important as the design and placement of a picturesque green or an ominously beautiful bunker.



(Above) This is a comparison of the native soil with the grey ash which was the fallout from Mount St. Helens and was dredged from the Cowlitz River. (Right) Green Number 13 built on top of a former garbage dump. Recapping with the same sand fill worked very effectively.

