



Rocky horror

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Golf Course Management

Wow. My first week as a superintendent, and already I was facing the prospect of replacing a 20-year-old irrigation system that was failing and inefficient.

After seven years as the assistant superintendent at the Purpoodock Club in Cape Elizabeth, Maine, I was promoted to the role of superintendent and lead project manager for installation of a state-of-the-art, \$1 million irrigation system. I was given the task at my first green committee meeting in the fall of 2001, planning started in 2002 and in the spring of 2005 we wrapped up the project.

So much for taking time to grow into my new position.

A rock-solid foundation

A magnificent feature of the Purpoodock Club is the exposed ledge rock on most parts of the course. Rock outcroppings start at our first tee and are present throughout the course, giving it a coastal New England flavor.

The Purpoodock Club's front nine was built in 1925, designed by the club's golf professional, Larry Rowe. In the 1960s, the club commissioned Jim McDonald, a local engineer who had designed other courses in the area, to design nine additional holes. The back nine was completed in 1964, with a majority of the construction being done by the members. They did the best they could at the time, but earthmoving was minimal. The course was literally built on a sea of rock.

As a result, several of our fairways are very hilly, and in some places you can see rock poking through — every summer the same spots burn out where there is little to no soil. Our rough has numerous areas where rock peeks through as well. Any excavation work done on or around the course, no matter how small the project, has involved dealing with granite, shale and loosely stacked cobbles — it seems we have every kind of rock that exists. One thing was certain: A project of this size was going to encounter massive amounts of rock.

To aid in development and construction of a new irrigation system, we hired an irrigation consultant, a decision that proved invaluable. Irrigation Consulting Inc. developed all the plans, set budgets, recommended contractors and performed construction supervision.

For a rock budget, the consultant put us in the highest category possible, allowing \$150,000 just for rock removal. This figure encompassed all aspects of the rock removal, including excavation, hauling away debris, purchasing clean backfill and buying teeth for the saw.

Breaking ground

During the bidding process, several contractors would not bid on the project because they had heard about the rocky conditions. Hiring a contractor who could deal with our site was key. We hired Tanto Irrigation based on the company's experience working with rock. Not only did they have all the equipment needed to deal with multiple scenarios, but they also gave us a job foreman who was highly skilled in dealing with rock and had just finished a rock job in Connecticut.

After assessing the site, the contractor told us the rock would slow them down, it would be messy in places and we should prepare some place to put the rock debris — but, the project was doable. Routing the pipe around known rocky areas was the first line of defense, but in most areas, rock could not be avoided. To calculate the cost of cutting through and removing the rock, Tanto measured the distance of rock cut by a rock wheel in feet. The debris from the rock hammer was measured by yards of material removed using a 4-yard dump trailer. Every morning I met with the job foreman to review and sign his daily work sheets showing the quantity of rock hit the previous day. I was amazed at how diligent they were in measuring the volume of rock in order to treat us fairly.

The equipment they used to handle the project included a rock hammer mounted to a Kobelco excavator to break rock for the main lines down the sides of the fairways. The hammer also was used for stubborn rock in the middle of the fairways. A Ditch Witch rock wheel was used for smaller lateral piping through the fairways and around greens and tees.

Once the project started, we discovered that even with the best equipment, the rock at Purpoodock was going to be more of a problem than we had anticipated. Our rock was so hard that the rock wheel teeth were wearing out about every 10 minutes, even though the expected lifespan is closer to an hour. At nearly \$300 a set, replacing the teeth that frequently was going to be an issue.

Representatives from Ditch Witch of New England came to the course to assess the project and recommended we switch to teeth made of a different type of carbide. Although the new teeth helped, they continued to wear out quickly in some areas. Still, we were grateful because we were paying for the teeth as part of our per-linear-foot cost of rock removal.

Off budget

The rock hammer was used the majority of the time and was very effective. Its very distinctive tapping sound could be heard all over the course. We joked that each tap was the sound of a dollar sign. The members here were very tolerant of the disruption and noise, yet they were cognizant of the sound of dollar signs, too. Before the project was initiated, we held two informational meetings and posted the plan for the new system in the front entry of the clubhouse. To keep them abreast of the progress, I replaced the plan with a corkboard where I posted pictures and construction details. When a hole had to be closed for construction, we would post an announcement in the pro shop.

Keeping Purpoodock members informed was a crucial aspect of the project and our success, especially since we had to modify our budget to account for the added time and effort required for rock removal.

At one point, Tanto pounded one 10-foot stretch for half a day and said that it was the hardest rock they had ever seen. It also slowed down their crew who had to wait for the trench to be cleared of debris and then had to haul in clean material to backfill the trench. About halfway through the project we had spent two-thirds of the budget. By the end of the project, we had spent about \$240,000 dealing only with rock, \$90,000 more than our original plan. Thankfully, we were under budget in other areas, which helped, but even so, we had to add to our bank loan. Furthermore, because of the rock, Tanto estimates the project took 30 percent longer to finish — this additional time and expense was not part of the original budget either.

Rocks and more rocks

After all the hammering and digging, we had mountains of rock debris that needed someplace to go. First, we filled in a hole in the woods next to our 17th fairway that had been excavated for soil when the golf course was originally constructed. We also used the debris to level off a slope next to the maintenance facility and create a parking area that now accommodates 10 cars. We also saved the more attractive rocks for future use in possible landscaping and gardens.

In several out-of-the-way locations Tanto removed clean topsoil to use in the trenches and backfilled the excavated area with rock debris. We tried to find locations close to where they were digging to help save time on a step that could not be skipped — proper installation required the use of clean material underneath and on top of the pipe.

Throughout the process Tanto also removed enough rock to ensure any future repairs can be made with “normal” excavation.

Subsurface surprises

One of the biggest surprises during the project was discovering the many areas where the terrain did not indicate what we found underneath. Several fairways and areas surrounding our greens show no outward signs of rock, yet we discovered ledge rock and shale almost all the way to the surface. About half an inch of soil covers the rock in these areas, but the turf growing on it is dense and looks great. Over the years these areas did require extra water in the heat of summer, but we were shocked at how many of these areas were found. Considering some of the divot marks we’ve seen, it is amazing none of our golfers has ever hit rock.

Having seen what is under this course, I am amazed at what we can grow. This course would not be constructed today without massive earthmoving and rock removal. The USGA agronomist who visits our course every year has confirmed this. When he probes our soil, he always remarks that a course like this would never be built today.

Although I can't change what is beneath the course, I can change my approach. Seeing how thin our soil is has given me a few ideas on changing cultural practices. I am going to experiment with wet-and-soak programs to see if I can keep those perennial dry spots from occurring, and I am going to ease up on the amount of granular fertilizer I apply to those areas in favor of foliar spoon-feeding to avoid runoff.

Looking back

I think the key for success in dealing with rock is using a contractor who has the equipment and experience needed for the job. Despite being slowed by the rock, Tanto had our new system up and running after just four and half months.

Daily communication with the contractor, as well as the members, our consultant and sales representatives is vital to keeping everything on an even keel. Being surrounded by people who are capable and experienced was tremendous, and they went far above the call of duty on this project, which made my job easier.

We did hit more rock than anyone ever could have predicted, and I still hear tapping in my sleep, but having an effective and efficient irrigation system was worth the trouble. And I do enjoy my new parking area.

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