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BETTER BILLY BUNKERS

In 2008, I reviewed several aspects of bunker construction, from style, to drainage to liners. At that time, I covered two basic groups of bunker liners – Fabrics and Hard Surfaces/Soil Binders.

I received a few letters wondering why I didn't discuss the "Billy Bunker." The reason was that I hadn't used them personally yet, and didn't feel comfortable opining on them. Now, I have several courses with bunkers under re-construction with the "Better Billy Bunker" method, including a bunker renovation at Cowboys Golf Club near Dallas, where I originally designed very steep bunkers and where we get some very heavy rain.

The early results have been impressive. Ed Easley, EAGL's construction coordinator in charge of the project says, "We have tried every bunker liner known to mankind...this is the 'silver bullet' of bunker lining."

As I wrote in 2008, I intuitively believe a hard surface liner should be superior to fabric liners, primarily because fabric liners eventually tear and require replacement. However, my experience with hard materials on native soils is that they are prone to cracking, much like non-reinforced concrete. At least, that is my experience here in the shrink-swell soils of Texas.

Those problems make the idea of the Better Billy Bunker method interesting, since its "sticky gravel" method conceptually splits the difference between the hard and soft layer methods. It may be the best of both worlds, although I suppose cynics could claim it's also the worst of both worlds.

The key defining feature is the 2-inch layer of clean gravel, coated with a specialized polymer spray, which is essentially a plastic. It seeps down through the gravel to harden it into a strong-but-flexible surface. This allows water to drain straight through

quickly – up to 400 inches per hour, enough for all but rains of biblical proportion. This drainage reduces the erosive forces on the sand surface because the major water movement is 2 inches below it. Wet sand is heavier and more prone to slump. In addition, the spray coating reduces the gravel's porous openings enough to minimize sand migration down and soil migration up. You do need to test the sand and gravel to make sure your two materials adequately "bridge" much like

It might be the best of both worlds, although I suppose cynics could claim it's also the worst of both worlds.

the requirements for a USGA green.

Installation cost using one of the "licensed" Better Billy Bunker installers (which is required) for the polymer is similar to fabrics, ranging from \$1.50-\$1.75 per square foot. However, there is additional cost to procure the gravel, which can vary by locale, so your costs might vary. Here in Dallas/Fort Worth, gravel costs from \$23-\$32 per ton, (and fuel costs are doing nothing but increasing gravel prices) adding about \$0.30 to the cost, making it slightly more expensive. You will likely spend about \$25,000 more on the Better Billy Bunker – always a tough choice in difficult economic times and on major projects.

Like the other methods, we are not sure of longevity, but the first installation of the Better Billy Bunker was eight years ago, and it's still in good shape, according to the company. However, this product should last at least as long as other methods. After all, what lasts longer than gravel and plastic? It probably will last longer.

Even with minor damage from soil shifting, it should be easy to repair small sections as required, similar to other hard surface liners.

Has this product changed my advice to superintendents looking to renovate problem bunkers? Well, yes, because it is impressive. And, no, because I have always urged a three part decision-making process.

Therefore, my first advice is to use a bunker liner, any bunker liner. I know without them, your bunkers will likely be a mess in a few short years. Bunkers liners have trickled down from the top clubs to become "standard" at all but the poorest courses. The decision has morphed from "whether to use liners" to "which liner to use."

Second, test them all in your conditions. I've used them all and each works, but you need to evaluate them in terms of your unique conditions. You'll have lesser need if in the desert rather than in Houston. If one method works best in your tests, use it, rather than one that doesn't work well to save a few thousand dollars up front.

Third, consider the longer term, including life cycle and daily labor costs, rather than only initial construction cost. It's easier to machine rake the Better Billy Bunker, if that is important to you. To be fair, newer, stronger bunker liners can also be raked, if carefully, than earlier products. Add in unscheduled sand shoveling after big rains, and the annual labor savings quickly and easily outpace the annual loan cost on initial construction.

At some point, you will need to budget for \$150,000 in bunker liners. Certainly, the old adage is you never skimp on your greens because of their importance. If bunkers now cost as much or more than greens to maintain, then the same adage applies. I urge you to pick the best product for your needs, regardless of cost. **GCI**

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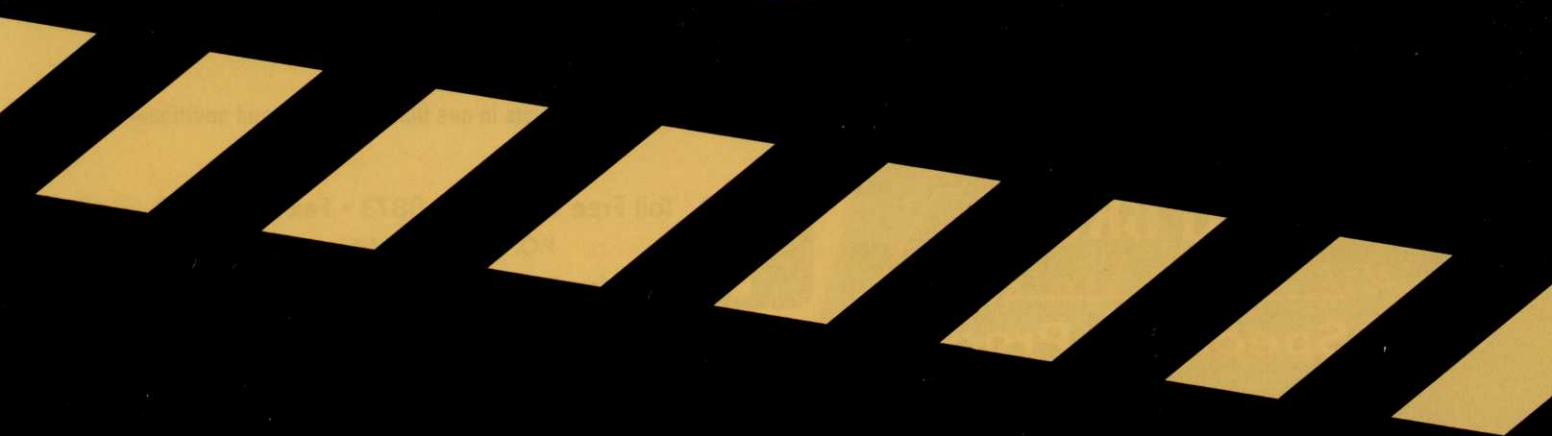
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By Bob Lohmann

Instead of creating a master plan for course renovations, a better approach is to compose smaller, more attainable projects to tackle.

Sometimes, maybe without trying, we stumble upon a bit of insight whose truth is reinforced over and over again by others who may have stumbled upon it at the same time.

This happened late last year when I wrote about renovation scheduling for GCI (Best Laid Plans, December 2012). In this article, I talked about the need for superintendents to formulate asset management plans, as opposed to master plans, so they might efficiently tackle small projects year to year, instead of saving/planning for big, overarching renovations that just aren't so feasible in today's golf economy.

Since that article, we've been approached by about half a dozen projects that are direct results of this kind of asset management planning. In some cases, superintendents and other management types have taken the master plans they have, or had, and simply chopped them up into more manageable pieces that can be scheduled over the course of years.

Maybe someone out there is listening. Or just maybe they independently recognized the same common-sense principals we did.

Either way, allow me to tick off three such projects in brief detail to provide some context. I'm confident their examples will strike superintendents as just the sort of efficient planning they can realize at their own facilities.



PINE VALLEY COUNTRY CLUB, FORT WAYNE, IND.

We had developed a master plan for this private club in the mid-1990s, and much of that plan was implemented. Since that time, however, there's been an ownership change at PVCC. It's a new ownership group, actually, consisting of 25 stakeholders, and there are naturally 25 different ideas about what renovation/upgrade work should be done going forward.

The superintendent asked us to help him organize a plan of attack. He didn't call it an asset management plan (AMP), but that's exactly what it was – a hit list of projects, some of which were never implemented from the old master plan and some which have become a priority in the 17 years since we last worked here. In fact, we're completing

the first of these AMP projects this winter: expanding a pond on the 4th hole and using the resulting fill to create bunkering and mounding where PVCC had lost some Ash and evergreen trees.

The funding here is worth noting. Each of these projects has a price tag ranging from less than \$10,000 up to \$100,000. These are good target figures for supers mulling an AMP. These smaller chunks of money can more easily be budgeted.

We now have five to 10 projects in the AMP pipeline at Pine Valley, many of which will be handled by in-house crews as a matter of extended maintenance services. It's hard to argue that this is a very practical way to target, tackle and fund a series of projects that, taken together, could not be tackled and funded in the foreseeable future.



MT. HAWLEY COUNTRY CLUB, PEORIA, ILL.

We have a long history working at this club, as well. We renovated all 18 greens back in 1997, based on a master plan we had done for the club in the early 1990s. Still, because



The 2nd hole of Lake Carroll Golf Course, Lake Carroll, Ill. before (left) and after the renovation (right).



The 9th hole of Lake Carroll Golf Course, Lake Carroll, Ill., before (left) and after the renovation (right).

of the catch-all nature of most master plans, there was plenty that never got done.

The new superintendent at Mt. Hawley, Josh Cull, has identified the need to upgrade the irrigation system, but he smartly came to us this winter so we might go through the old master plan, pluck the jobs that never got done, and create an asset management plan that prioritizes and integrates irrigation needs with other needs (bunker renovation and relocation foremost among them). The AMP we've devised is laid out like a giant menu, giving the club the choice to eat light (small projects) or dive into an entrée, depending on their budgetary appetite. Right now, the latter is appealing, but we're still working through the details.

Another word here about cost: At both PVCC and Mt. Hawley, we're working to keep costs low by enabling the client to execute big chunks of work in-house, where we essentially project manage the work. Back in the 1990s, course-construction firms rarely countenanced the sacrifice of revenue in this manner, mainly because money was abundant and they weren't asked to. But these are different times. Supers

should be sure to explore these options when they are pricing out AMP component projects. It can be a huge money-saver.



LAKE CARROLL GOLF COURSE, LAKE CARROLL, ILL.

Truth be told, a lot of our philosophy on AMPs was forged in doing work for this northwest Illinois club. We did a master plan for Lake Carroll GC in 2006, with the intention at one point of tackling the whole thing in three to six \$250,000 to \$1,000,000 phases. We completed Phase I, and then the downturn killed that idea (along with the master plan as a viable planning mechanism, in many cases). However, since that time, we have continued to phase a whole host of meaningful annual upgrades – 18 green-surrounds renovations, in three phases; a new 8th hole; a driving range expansion; two new greens.

Since Phase I, we've never spent more than \$125,000 in any one year, but the impact on the facility has been huge – while the footprint each fall (when we invariably tackle these projects) remains small and unobtrusive.

That's the beauty of the asset management plan. Each year the superintendent can adjust his or her priorities according to need and available funding.

LCGC also proved, to us anyway, that the in-house construction model was viable (with the right crews and oversight). Superintendent Tim Throop and his crews do their own rototilling, tree clearing and they buy their own materials, including installation of some of them. This saves them money and they're so good at it now, it's made our work pretty darned efficient: We come in later in the fall and get all our work done in three to four weeks.

There's one thing that has remained utterly constant from the old Master Plan Era through to today's emerging Asset Management Plan Era: Plans change. You'll notice that all three of the AMPs cited here include projects from previous master plans that never got done. The clients at Lake Carroll have long wanted to improve their 17th hole; our original idea was to lengthen it to a par 5 and shorten the 18th.

We held on to that idea as long as possible but realized this fall that it would never get done. So we elected to update the surrounds of the existing 17th green instead, and will look to improve the fairway and tee layout as a future phase of the AMP.

That's the beauty of the asset management plan. Each year the superintendent can adjust his or her priorities according to need and available funding. Hell, he or she can revisit those every day, if need be. We all recognize that courses need to reinvest to protect and enhance course value. The AMP lends some much needed flexibility to this process. **GCI**

Bob Lohmann is founder, president, and principal architect of Lohmann Golf Designs and a frequent GCI contributor. Check out his blog at lohmanncompanies.blogspot.com

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The road to
RECOVERY

Summer heat devastated the new tee boxes at Makray Memorial Golf Club. Superintendent Timothy Christians details his path toward reestablishing even stronger turf.



No. 13 tee upon completion. You can see a significant difference from the tee prior to construction.

Below: Pythium damage on a newly established bentgrass tee box. The picture shows where a mower had spread the disease affecting the entire mowing line.



By Timothy Christians

I reflect back at the 2012 growing season and I can't think of any college class, internship or assistant position that prepared me for the extreme growing conditions that I saw. Yet the lessons learned will forever change the way I manage cool-season turfgrass under Mother Nature's wrath.

Seasoned superintendents will speak of the summers of 1988 and 1995, both creating equally yet opposite extremes. The summer of 1988 was one of the driest and hottest summers on record, whereas the summer of 1995 saw record heat combined with record moisture. However, for younger superintendents, in most cases this has been the first summer battling weather extremes of such proportion.

Whether it was your first season as a superintendent or your 35th, it was a tough year to maintain healthy playing surfaces and you most likely lost some turf on areas of your property. For me, in my sixth season as a head golf course superintendent and my fourth season at Makray Memorial Golf Club, we had dramatic decline in the health of our tees. Many factors contributed to this decline, however the sharp increase in summer's extremes was the primary cause for turfgrass loss.

Statistically speaking, this past season was like no other. Drought-like conditions, combined with unprecedented temperatures caused harsh growing conditions that were less than ideal for cool-season grasses and ornamentals. The growing season started with a bang, unprecedented warm temperatures combined with a dry, mild winter brought grass out of dormancy and golfers out in droves. March saw record highs consistently broken along with average rainfall. This was great for root growth as well as the cash registers. This warm weather jump started disease development and had our mowers running earlier than normal. Much of this work had to be done without the assistance of seasonal staff. The spring returned to normal and we were able to catch up with spring clean up prior to the summer rush.

As we moved towards summer, May was

dry and had us reaching for our hoses battling wilt. The temperatures touched the 90's, however disease pressure was low. Then as June came we turned on our wells to keep up with our lack of rain. The grass required frequent supplemental irrigation to keep things green. Like the last two seasons, in the first weekend of July, things got bad – multiple days with triple-digit highs and lows in the 80s. Soil temperatures skyrocketed and turfgrass decline was quick and irreversible. During that time we experienced four consecutive record high temperatures shattered and no relief in sight.

As the summer moved along, we went from dry to drought. Roughs saw the irrigation shut off to preserve water for greens, tees and fairways. Grass went dormant and teetered on irreversible damage, while irrigation pumps ran hard to keep bentgrass and *Poa annua* alive. It wasn't just golf courses feeling the drought effects. Farmers saw massive crop decline and wildfires were a threat across much of the country. Most of Illinois was in an extreme drought with parts in an exceptional drought. Nationwide, the total cost of the 2012 drought is estimated to be more than \$12 billion.

At Makray Memorial Golf Club, we had just finished reseeding 40 tee boxes the previous fall. The decision to reestablish tees was due to excessive wear with lack of area to promote recovery. We initially decided to switch to the improved variety of Crystal Bluelinks bentgrass with characteristics of quick establishment and improved wear tolerance. Our goal was to utilize this improved variety without having to totally renovate the tees. The warm spring did wonders for establishing good growth and bringing them into play, however they were still immature and did not have an established root system. This would be one of the many factors that spelled doom for these tee boxes going into summer.

As the spring progressed, we decided to open the tee boxes in the middle of May. At the time they were opened for play, the tee boxes showed great health and color. Summer moved along quickly and the tees grew in nicely. However, in June and July we began

to back off some of the agronomic practices needed to establish quality tee boxes. We decided to back off our frequent topdressing and light fertilizer applications in fear of overstimulating the turfgrass. This caused the grass to weaken, not getting the essential nutrients needed for healthy growth. During this time we also saw little to no rainfall and triple-digit temperature extremes. With

their inadequate root development, these tees relied heavily on frequent irrigation to survive. Having to rely solely on supplemental irrigation, the turf was now starting to show signs of stress. With the dry, hot weather, we were also seeing an unusually high amount of play. The daily wear of foot traffic and divots was too much for our tee boxes and their lack of square footage. We decided to heavily



Corrugated drain lines with pea gravel were installed to move water from the tee surface.

topdress and fertilize the tees during a cool down in August to speed recovery. This decision would be fatal to some tees as the cool down didn't last and the immature tees were covered in sand and overstimulated.

During this stretch of unprecedented summer heat, we were also under high disease pressure. We have used phosphites to control pythium in the past with great success on all turfgrass surfaces. We treated the tees all season with phosphites, expecting to see the same results as the past. However, with an immature plant that is extremely susceptible to pythium, the phosphites would not be enough. We had an outbreak of pythium on many tees and were not able to catch it quick enough to avoid turfgrass loss.

The damage had been done and we had lost grass on our tees. The dog days of summer were behind us and the road to recovery would begin. We were in the prime seeding window of Aug. 15 to Sept. 15, so we made the decision to overseed all the tee boxes. This time rather than mulling over National Turfgrass Evaluation Program (NTEP) data and research articles of which seed would be our best fit, I decided to use the best resource any young superintendent has. I spoke to other superintendents in the area who had seen season after season like this and adapted their agronomic practices to the extremes of summer. After some sound advice from trusted colleagues, the decision was made to use the old standby variety of pennncross. Pennncross is one of the older and more aggressively stoloniferous varieties and has been well adapted in the Chicagoland area for use on tees.

Prior to reestablishing our tees in the previous fall, we had purchased a Turfco Triwave walk-behind seeder. This seeder came highly recommended and we saw great results with

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