

“Think long-term when it comes to cart path construction,” Grigg says. “The only people who think short-term are the developers who are going to come in, create a golf course and then turn around and sell it. They don’t have to worry about maintenance issues, so they’re going to do whatever is cheapest.”

Grigg says even though it will cost less to do an asphalt cart path, it will be harder to maintain and won’t look as good to the members.

Tips for construction

Here are some tips Grigg and Schulties offer to superintendents who are building cart paths:

- Use concrete instead of asphalt whenever possible.

“Concrete will cost a little more up front, but it’s going to last longer than asphalt,” Grigg says.

Grigg suggests using 4,000 pounds of pressure per square inch concrete rather than the standard 3,000 psi because it will stand up better to the pressure of constant car traffic.

- Make sure the concrete contains fiber mesh, which holds concrete together under normal expansion and contraction of the ground.

“Fiber mesh adds little to the cost of the path itself, but it makes it far easier to maintain later,” Schulties says. “Small cracks don’t become big cracks as quickly.”

- Remember that concrete is designed to crack.

“If you’re going to use concrete, make sure you lay it in sections,” Schulties says. “It’s easier to replace one section of concrete — and it’s a lot more aesthetically pleasing than patching asphalt.”

Grigg says he avoids steel-mixed concrete because it rusts easily.

“You’re going to have a lot of cracks expand a lot more quickly if you use steel because of the rust,” Grigg says. “Once rust sets it, it breaks down the concrete.”

Expansion joints should also be cut at the end of each concrete section, Grigg says. An expansion joint should generally be one-quarter the total height of the path. These man-made cracks give the concrete somewhere to go as the ground stretches and contracts.

“This will prevent larger cracks from forming in the center of sections,” Grigg says.

Expansion joints must be cut the same day the concrete is poured, he says.

- Hire an engineer to oversee the layout and construction of the path.

Most golf course architects steer clear of actually building the paths because of the liability issues involved, Schulties says. An engineer will have the knowledge necessary to build a safer cart path.

- Evaluate the soil to determine the path’s substructure. It’s important to understand what the soil composition is

Cart Path Caveats

Michael Hurdzan, Ph.D., of Hurdzan Fry, a Columbus, Ohio golf course architecture firm, steers his firm away from designing cart paths because of liability issues (“We’d make lousy witnesses if there were lawsuits involved,” he says), but that doesn’t mean he doesn’t have opinions about what NOT to do with cart paths. Here’s his five-step primer:

1. Don’t make the cart paths too steep. The grade should not exceed normal engineering standards for roadways.
2. Don’t create turns that are too sharp. Combine sharp turns with any sort of grade, and you’re asking for trouble.
3. Don’t make the cart path too narrow.
4. Don’t ignore the importance of warning signs, guard rails and speed bumps. In case of litigation, these precautions could reduce your liability.
5. Don’t share cart paths on two different holes. If you do, you’re putting people in harm’s way.

Hurdzan also cautions superintendents to keep the cart paths well maintained, particularly in the fall if the path lies under trees that lose leaves. Leaves, combined with water, turn a cart path into an accident waiting to happen.

“There have been some tragic accidents — even deaths — from golf car accidents,” Hurdzan says. “Treat them like roads, rather than paths, and you should be all right”

where the planned cart path will rest, Schulties says.

“Different soils will require different strategies,” Schulties says. “Take the extra time to do the project right.”

- If asphalt is the choice, mix it with at least 5 percent cement.

Mixing cement with asphalt increases its stability, Grigg says. Typically, an asphalt cart path will be 2 inches in height, Grigg says.

- Develop a good base.

Grigg suggests 4 inches of compacted limestone provides a solid foundation for most cart paths.

- Promote dual uses for cart paths.

Since cart paths need to exist on most golf courses, Schulties says courses should be creative in their use to serve more than one purpose. For example, design a cart path on the side of a hill and pitch it away from the fairway. Then hide drainage basins in the path to draw excess water.

“It’s proven that this technique will help make the fairways more maintainable for the superintendent,” Schulties says. “Don’t be afraid to be creative.”

Grigg says cart path construction always depends on the budget and what a superintendent is trying to accomplish.

“Everything having to do with cart path construction is predicated on cost,” Grigg says. “You can get all the advice in the world, but in the end you have to do what’s possible with the amount of money you’ve been given to spend.” ■

The Human Touch

■ EMPLOYMENT ISSUES

If the Y2K transition taught us anything, it was the importance of thorough planning for an event whose impact no one could predict. Many people saw it as an event that would affect others more than it would affect them. But even the most cynical critic had to admit that Y2K would have some effect on us.

What got me about the oncoming of Y2K was the endless proliferation of checklists. There was a checklist for everything: food, water and other necessities whose availability might be interrupted by the changeover. I like the idea of checklists, and I like the idea of the thought discipline that goes into their development and use.

The need for checklists has not been eliminated with the advent of the new millennium. Like Y2K, there's another issue facing all of us in this industry, and it has to do with attracting and retaining good people.

In other times, this was not a big deal. Call some contacts, do some networking and the position was filled. But things are different now, and there is no reason to believe that labor-intensive businesses like golf courses are going to see relief any time soon.

The problem requires a new and more aggressive role on the part of superintendents and the folks who report to them. The reality is that while club members may be experiencing the same pressures in their own businesses, they will be far less tolerant of short-handed staffs who fail to provide good service and upkeep.

Every well-coordinated plan starts with a collection of tasks and things to do. Not all tasks are created equal in terms of importance, but when fully integrated they should form a well-defined picture of what must be done. Here are some things, in checklist form, that superintendents should consider regarding their employees:

- How satisfied am I with the quality and quantity of my employees?
- Are the issues my customers continue to discuss about the club traceable to performance problems with my employees?
- When was the last time I sat down with my management team and did a review of our employees' strengths and weaknesses, formulated a plan to recognize and reward good performers and correct the deficiencies of poor performers?
- Have I taken a leadership role in contacting

Keeping Tabs On Your Employees

BY DAVE ST. JOHN



CHECK OUT THIS CHECK LIST TO HELP YOU ASSIST AND RETAIN TOP EMPLOYEES

and regularly interacting with organizations that could help me with my people-related needs?

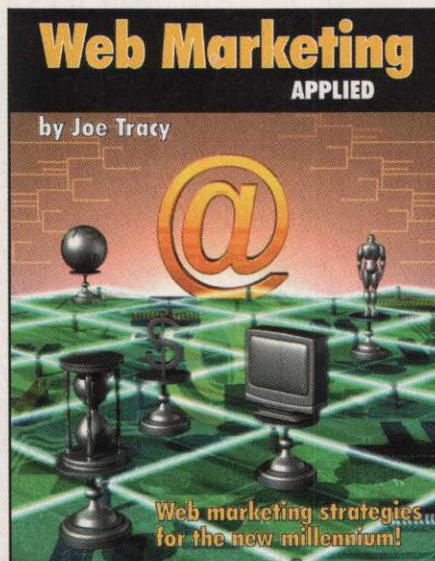
- Have I developed internships and other industry orientation programs to provide first-hand information about solid careers in this field to interested, but undecided, potential employees?
- Do my current employees regard this as a good place to work, and if so, how many others would they refer to work here?
- When was the last time I did a quick survey to determine whether my pay scales and benefit offerings were competitive with similar roles in the surrounding community?
- Are there available, but unused, opportunities for outside training and certifications for good people on my staff?
- Have I gotten to know something about each of my folks, such as their birthdays, wedding anniversaries, birth of children, which give me an opportunity to do something thoughtful and unexpected for them?
- Am I able to use time off as a reward for top performers?
- Do I think outside the box when it comes to devising ways to recognize and reward good performers?
- If I have a large Hispanic/Latino workforce, am I looking for ways to improve their communication skills and encourage upward mobility?
- Do I encourage feedback (good or bad) about my group's performance from our customers?
- Do I use this information constructively to raise lowered standards?

The list goes on, but I'm sure you get the picture. By any measure, the attraction and retention of good people will continue to be a top concern well into this millennium.

And you thought Y2K was tough.

Dave St. John is co-founder of GreenSearch, an Atlanta-based human resources consulting firm. He can be reached at fjserv@mindspring.com

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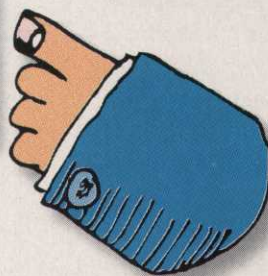
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Case Study #1

■ MAINTENANCE

Bunker Mentality

Westfield CC's bunker renovation pitted mind against matter

BY FRANK H. ANDORKA JR.,
ASSOCIATE EDITOR

Bunkers deteriorate over time. Between the constant battering they take from Mother Nature to the number of players whose errant wedge shots spray sand on the surrounding turf, it's surprising they don't have to be reconstructed more often.

Eventually, the wear and tear shows, and superintendents are often left in the unenviable position of fixing something in a few weeks that took three decades to create.

That's the challenge Mark Jordan, superintendent at Westfield CC in

Westfield Center, Ohio, faced when it came to renovating the back-nine bunkers on the South Course. Designed by Geoffrey S. Cornish in 1968, the bunkers on the back nine featured high splashes and open faces, a contemporary look for the club at the time.

By the time reconstruction started, however, 31 years of play had worn the bunkers down, leaving them weathered and bedraggled.

Westfield hired Craig Schreiner, a Kansas City, Mo.-based golf architect, in 1994 to create a master plan for the North and South Course renovations, including the bunker renovations implemented last year.

"Most bunkers have a life expectancy of 30 years," Jordan says. "It was important to us to re-evaluate each of the bunkers and fix them."

Schreiner says he wanted to reconfigure the bunkers to bring them back into the strategic thinking of the players.

"Our goal was to force the better players to take the bunkers into consideration before they hit shots," Schreiner says. "With better bunkers, you can also bring out the real character of the greens."

The problem

Thirty-one years of play created problems on three lev-



Westfield CC excavated new bunkers to return strategic thinking to its South Course's back nine.

els for the 37 bunkers:

- Time-consuming hand maintenance drained both the budget and led to the neglect of other parts of the course.
- Years stripped many of the bunkers of their playability, leaving players grouching about bad lies, puddles in the bunkers and uneven sand distribution throughout.
- As the course matured, tree and vegetation growth altered course layout, rendering several bunkers toothless tigers.

In addition, the course purchased different sand types to fill the bunkers as it became necessary over the years. The practice produced different layers of sand, which hindered proper drainage, affected playability and allowed drainage stones to pierce the surface as a result of the natural expansion and contrac-

tion of the ground during Ohio's winters. "We were spending an inordinate amount of time on these bunkers, taking out stones and making sure the sand didn't completely wash out when it rained," Jordan says.

Jordan knew the bunkers weren't up to the standards he — or the members — wanted. But how could Jordan bring the bunkers up to modern standards without destroying the strategic integrity of the course?

"It wasn't just a matter of ripping up the old ones and putting in new ones," Jordan says. "We knew we were going to lose some of them — they had outlived their usefulness as the course matured — but we wanted to have someone do this renovation who could see the course as Cornish saw it."

Continued on page 96

Problem

Uneven sand and poor drainage made many of the back-nine bunkers unplayable.

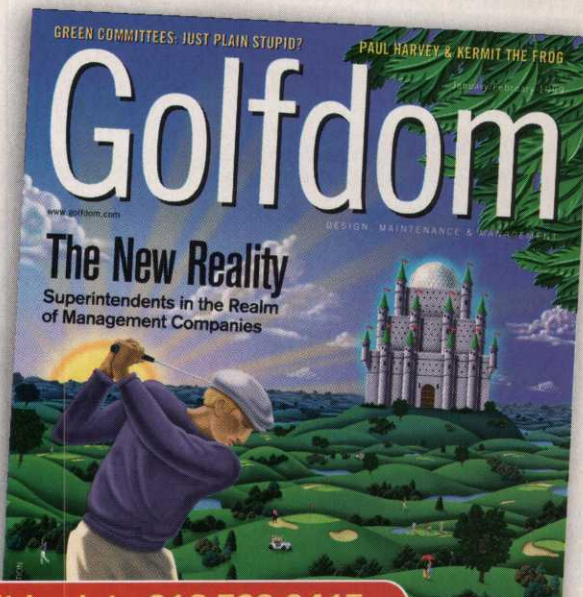
Solution

Replace the sand in the old bunkers to uniform depth.

Add more drainage tile to prevent puddling.

Create new bunkers to restore the strategic integrity of the course as originally envisioned.

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 - 70 Golf Course Developer
 - 80 Golf Course Owner/Operator/Management Company
 - 90 Golf Course Builder
 - 95 Education
 - 100 Others Allied to the Field (please specify) _____

2. Which of the following best describes your title? (fill in ONE only)

- 10 Golf Course Superintendent
- 15 Assistant Superintendent
- 20 Other Maintenance Professional
- 25 Owner/CEO
- 30 General Manager
- 35 Director of Golf
- 40 Green Committee Member
- 45 Club President
- 50 Construction Company Official
- 55 Architect/Engineer
- 60 Research Professional
- 65 Other Titled Personnel (please specify) _____

3. What are the types of turf on your:

- | | | |
|--|--|--|
| A. GREENS | B. TEES | C. FAIRWAYS |
| 1 <input type="radio"/> Bent | 1 <input type="radio"/> Bent | 1 <input type="radio"/> Bent |
| 2 <input type="radio"/> Bermuda | 2 <input type="radio"/> Bermuda | 2 <input type="radio"/> Bermuda |
| 3 <input type="radio"/> Rye | 3 <input type="radio"/> Rye | 3 <input type="radio"/> Rye |
| 4 <input type="radio"/> Other (please specify) _____ | 4 <input type="radio"/> Fescue | 4 <input type="radio"/> Fescue |
| | 5 <input type="radio"/> Other (please specify) _____ | 5 <input type="radio"/> Zoysia |
| | | 6 <input type="radio"/> Other (please specify) _____ |

4. What is your facility's annual maintenance budget?

- A More than \$2 Million
- B \$1,000,001-\$2 Million
- C \$750,001-\$1 Million
- D \$500,001-\$750,000
- E \$300,001-\$500,000
- F \$150,001-\$300,000
- G Less than \$150,000

5. If you work for a golf course, how many holes are on your course?

- A 9
- B 18
- C 27
- D 36+
- E Other (please specify) _____

6. Are you the person responsible for golf car purchasing/leasing?

- A Yes
- B No

7. Are you directly involved in purchasing decisions for your facility?

- A Yes
- B No

7A. If yes, which of these products do you specify, buy or approve?

- | | | |
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| A <input type="radio"/> Aerators (pond) | P <input type="radio"/> Insecticides | 5 <input type="radio"/> Sod |
| B <input type="radio"/> Architectural Services | Q <input type="radio"/> Irrigation Systems | 6 <input type="radio"/> Soil Analysis |
| C <input type="radio"/> Batteries | R <input type="radio"/> Irrigation Parts | 7 <input type="radio"/> Sprayers |
| D <input type="radio"/> Biostimulants | S <input type="radio"/> Landscaping | 8 <input type="radio"/> Spreaders |
| E <input type="radio"/> Construction Services | T <input type="radio"/> Lubricants | 9 <input type="radio"/> Tanks/USTs |
| F <input type="radio"/> Chain Saws | U <input type="radio"/> Mowers | 10 <input type="radio"/> Tires |
| G <input type="radio"/> Course Accessories | V <input type="radio"/> Nematicides | 11 <input type="radio"/> Tools |
| H <input type="radio"/> Cultivation Equipment | W <input type="radio"/> Pond Management | 12 <input type="radio"/> Tree Care |
| I <input type="radio"/> Drainage Supplies | X <input type="radio"/> Pumps/Stations | 13 <input type="radio"/> Turf Markers |
| J <input type="radio"/> Erosion Control | Y <input type="radio"/> Rakes | 14 <input type="radio"/> Uniforms |
| K <input type="radio"/> Fertilizers | Z <input type="radio"/> Range Supplies | 15 <input type="radio"/> Utility Vehicles |
| L <input type="radio"/> Fungicides | 1 <input type="radio"/> Safety Products | 16 <input type="radio"/> Weather Systems |
| M <input type="radio"/> Generators | 2 <input type="radio"/> Sand | 17 <input type="radio"/> Wetting Agents |
| N <input type="radio"/> Golf Cars | 3 <input type="radio"/> Seed | 30 <input type="radio"/> All of the above |
| O <input type="radio"/> Grinders/Sharpeners | 4 <input type="radio"/> Snow Equipment | |

8. Do you have Internet Access?

- A Yes
- B No

9. If so, how often do you use it?

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- C Monthly
- D Occasionally

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Case Study #1

Continued from page 94

Schreiner says most people don't realize how much a golf course can change over the course of time.

"A golf course is a living biomass," he says. "It's a dynamic system. Strategic architecture changes when you do it in a setting like that. We wanted to return

some of that strategic architecture to the course under current conditions."

Scheduling conflicts created another challenge for Jordan: Schreiner's vision for the bunkers had to be completed in a mere 10 weeks.

"We were working on a tight schedule, but Craig was convinced we

could do this in that time," Jordan says. "So everyone, in all aspects of the project, rolled up their sleeves and went to work."

"We got lucky with the weather," Schreiner adds.

The solution

The process started with cleaning the old bunkers of disparate sand layers and digging up the old drainage tile.

Then Jordan and his crew replaced 10,000 yards of sod and redid the drainage on many of the bunkers with 2,500 feet of 4-inch tile, 1,300 feet of 6-inch tile and 380 feet of 8-inch tile.

"You can never have too much drainage in the bunkers," Jordan says. "We spared no expense when it came to that."

After filling in the outdated bunkers and excavating new ones where Schreiner suggested, it was time for the new sand to replace the old. Using 730 tons of Chardon, Ohio-based Best Sand's Tour Signature product — a finely ground angular sand — the crew filled in the bunkers. Jordan chose Tour Signature because its composition allowed the bunkers to firm up more quickly — which with a 10-week window was vital.

Schreiner says he also deepened the bunkers and articulated the faces more sharply to make them true obstacles.

With consistent sand and better drainage, Jordan's team spends less time on intense bunker maintenance, and players have praised the bunkers' increased playability. Most importantly, Jordan says the structural modifications to the bunkers returned the course closer to Cornish's original vision for it.

Jordan says he hopes a similar bunker reconstruction can take place for the front nine this fall.

"That's the date we're aiming for, but there are no guarantees in this business," Jordan says. "It's something we're looking forward to doing." ■

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The collage features a computer monitor displaying the TurfNet.com website. The website's header includes the logo and the tagline "CUTTING-EDGE COMMUNICATION FOR THE GOLF COURSE INDUSTRY". The main content area has a "Welcome to TurfNet.com!" message and a "SIGN UP NOW!" button. There are sections for "MEMBERSHIP INFO", "EMPLOYMENT", "USED EQUIPMENT", "THE FORUM", "THE LIBRARY", "RESEARCH REPORTS", "FACTORY LINKS", "TURF LINKS", "WEATHER", "TURF EVENTS", and "GUESTBOOK". A "LOVE IT?" section lists recent news items. A "Latest Job Listing" section advertises an Assistant Superintendent position at Hunter Ranch Golf Course. A "Used Equipment" section advertises an E-Z-GO DASH Beverage Cart. The collage also includes a document titled "TurfNet.com Contract" with the text "If dazed and confused..." and "We today is too complicated...".

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| 03 <input type="radio"/> 30 Private | 10 <input type="radio"/> 90 Golf Course Builder |
| 04 <input type="radio"/> 40 Resort | 11 <input type="radio"/> 105 University/College |
| 05 <input type="radio"/> 50 City/State/Municipal | 12 <input type="radio"/> 100 Others Allied to the Field |
| 06 <input type="radio"/> 55 Other Golf Courses
(please specify) _____ | (please specify) _____ |

2. Which of the following best describes your title? (fill in ONE only)

- | | |
|--|--|
| 13 <input type="radio"/> 10 Golf Course Superintendent | 20 <input type="radio"/> 45 Club President |
| 14 <input type="radio"/> 15 Assistant Superintendent | 21 <input type="radio"/> 75 Builders/Developers |
| 16 <input type="radio"/> 25 Owner/CEO | 22 <input type="radio"/> 55 Architect/Engineer |
| 17 <input type="radio"/> 30 General Manager | 23 <input type="radio"/> 60 Research Professional |
| 18 <input type="radio"/> 35 Director of Golf | 24 <input type="radio"/> 65 Other Titled Personnel |
| 19 <input type="radio"/> 70 Green Chairmen | (please specify) _____ |

3. What are the types of turf on your:

- | | | |
|---|---|---|
| A. GREENS | B. TEES | C. FAIRWAYS |
| 25 <input type="radio"/> 1 Bent | 29 <input type="radio"/> 1 Bent | 34 <input type="radio"/> 1 Bent |
| 26 <input type="radio"/> 2 Bermuda | 30 <input type="radio"/> 2 Bermuda | 35 <input type="radio"/> 2 Bermuda |
| 27 <input type="radio"/> 3 Rye | 31 <input type="radio"/> 3 Rye | 36 <input type="radio"/> 3 Rye |
| 28 <input type="radio"/> 4 Other (please specify) _____ | 32 <input type="radio"/> 4 Fescue | 37 <input type="radio"/> 4 Fescue |
| | 33 <input type="radio"/> 5 Other (please specify) _____ | 38 <input type="radio"/> 5 Zoysia |
| | | 39 <input type="radio"/> 6 Other (please specify) _____ |

4. What is your facility's annual maintenance budget?

- | | |
|--|--|
| 40 <input type="radio"/> A More than \$2 Million | 44 <input type="radio"/> E \$300,001-\$500,000 |
| 41 <input type="radio"/> B \$1,000,001-\$2 Million | 45 <input type="radio"/> F \$150,001-\$300,000 |
| 42 <input type="radio"/> C \$750,001-\$1 Million | 46 <input type="radio"/> G Less than \$150,000 |
| 43 <input type="radio"/> D \$500,001-\$750,000 | |

5. If you work for a golf course, how many holes are on your course?

- | | | |
|-------------------------------|--------------------------------|---|
| 47 <input type="radio"/> A 9 | 49 <input type="radio"/> C 27 | 51 <input type="radio"/> E Other (please specify) _____ |
| 48 <input type="radio"/> B 18 | 50 <input type="radio"/> D 36+ | |

6. Are you the person responsible for golf car purchasing/leasing?

- 52 A Yes 53 B No

7. Are you directly involved in purchasing decisions for your facility?

- 54 A Yes 55 B No

7A. If yes, which of these products do you specify, buy or approve?

- | | | |
|---|---|--|
| 56 <input type="radio"/> A Aerators (pond) | 71 <input type="radio"/> P Insecticides | 86 <input type="radio"/> 5 Sod |
| 57 <input type="radio"/> B Architectural Services | 72 <input type="radio"/> Q Irrigation Systems | 87 <input type="radio"/> 6 Soil Analysis |
| 58 <input type="radio"/> C Batteries | 73 <input type="radio"/> R Irrigation Parts | 88 <input type="radio"/> 7 Sprayers |
| 59 <input type="radio"/> D Biostimulants | 74 <input type="radio"/> S Landscaping | 89 <input type="radio"/> 8 Spreaders |
| 60 <input type="radio"/> E Construction Services | 75 <input type="radio"/> T Lubricants | 90 <input type="radio"/> 9 Tanks/USTs |
| 61 <input type="radio"/> F Chain Saws | 76 <input type="radio"/> U Mowers | 91 <input type="radio"/> 10 Tires |
| 62 <input type="radio"/> G Course Accessories | 77 <input type="radio"/> V Nematicides | 92 <input type="radio"/> 11 Tools |
| 63 <input type="radio"/> H Cultivation Equipment | 78 <input type="radio"/> W Pond Management | 93 <input type="radio"/> 12 Tree Care |
| 64 <input type="radio"/> I Drainage Supplies | 79 <input type="radio"/> X Pumps/Stations | 94 <input type="radio"/> 13 Turf Markers |
| 65 <input type="radio"/> J Erosion Control | 80 <input type="radio"/> Y Rakes | 95 <input type="radio"/> 14 Uniforms |
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| 67 <input type="radio"/> L Fungicides | 82 <input type="radio"/> 1 Safety Products | 97 <input type="radio"/> 16 Weather Systems |
| 68 <input type="radio"/> M Generators | 83 <input type="radio"/> 2 Sand | 98 <input type="radio"/> 17 Wetting Agents |
| 69 <input type="radio"/> N Golf Cars | 84 <input type="radio"/> 3 Seed | |
| 70 <input type="radio"/> O Grinders/Sharpeners | 85 <input type="radio"/> 4 Snow Equipment | |

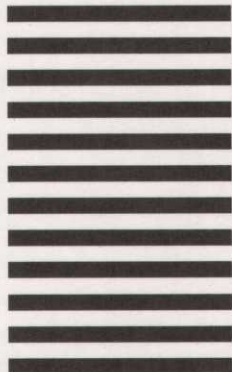
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| 101 | 113 | 125 | 137 | 149 | 161 | 173 | 185 | 197 | 209 | 221 | 233 | 245 | 257 | 269 | 281 | 293 | 305 |
| 102 | 114 | 126 | 138 | 150 | 162 | 174 | 186 | 198 | 210 | 222 | 234 | 246 | 258 | 270 | 282 | 294 | 306 |
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| 107 | 119 | 131 | 143 | 155 | 167 | 179 | 191 | 203 | 215 | 227 | 239 | 251 | 263 | 275 | 287 | 299 | 311 |
| 108 | 120 | 132 | 144 | 156 | 168 | 180 | 192 | 204 | 216 | 228 | 240 | 252 | 264 | 276 | 288 | 300 | 312 |
| 109 | 121 | 133 | 145 | 157 | 169 | 181 | 193 | 205 | 217 | 229 | 241 | 253 | 265 | 277 | 289 | 301 | 313 |
| 110 | 122 | 134 | 146 | 158 | 170 | 182 | 194 | 206 | 218 | 230 | 242 | 254 | 266 | 278 | 290 | 302 | 314 |
| 111 | 123 | 135 | 147 | 159 | 171 | 183 | 195 | 207 | 219 | 231 | 243 | 255 | 267 | 279 | 291 | 303 | 315 |
| 112 | 124 | 136 | 148 | 160 | 172 | 184 | 196 | 208 | 220 | 232 | 244 | 256 | 268 | 280 | 292 | 304 | 316 |



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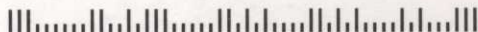
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Golfdom

February 2000
 This card is void after April 15, 2000

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NAME (please print) _____ TITLE _____
 FIRM _____
 ADDRESS* _____
 CITY _____ STATE _____ ZIP _____
 PHONE (____) _____ FAX (____) _____
 E-MAIL ADDRESS _____
 *Is this your home address? Yes No

I would like to receive GOLFDOM free each month: Yes no

Signature _____ Date _____

1. My primary business at this location is: (fill in ONE only)

GOLF COURSES

- | | |
|--|---|
| 01 <input type="radio"/> 10 Daily Fee/Public | 07 <input type="radio"/> 60 Golf Course Architect |
| 02 <input type="radio"/> 20 Semi-Private | 08 <input type="radio"/> 70 Golf Course Developer |
| 03 <input type="radio"/> 30 Private | 10 <input type="radio"/> 90 Golf Course Builder |
| 04 <input type="radio"/> 40 Resort | 11 <input type="radio"/> 105 University/College |
| 05 <input type="radio"/> 50 City/State/Municipal | 12 <input type="radio"/> 100 Others Allied to the Field
(please specify) _____ |
| 06 <input type="radio"/> 55 Other Golf Courses
(please specify) _____ | |

2. Which of the following best describes your title? (fill in ONE only)

- | | |
|--|--|
| 13 <input type="radio"/> 10 Golf Course Superintendent | 20 <input type="radio"/> 45 Club President |
| 14 <input type="radio"/> 15 Assistant Superintendent | 21 <input type="radio"/> 75 Builders/Developers |
| 16 <input type="radio"/> 25 Owner/CEO | 22 <input type="radio"/> 55 Architect/Engineer |
| 17 <input type="radio"/> 30 General Manager | 23 <input type="radio"/> 60 Research Professional |
| 18 <input type="radio"/> 35 Director of Golf | 24 <input type="radio"/> 65 Other Titled Personnel
(please specify) _____ |
| 19 <input type="radio"/> 70 Green Chairmen | |

3. What are the types of turf on your:

- | | | |
|---|---|---|
| A. GREENS | B. TEES | C. FAIRWAYS |
| 25 <input type="radio"/> 1 Bent | 29 <input type="radio"/> 1 Bent | 34 <input type="radio"/> 1 Bent |
| 26 <input type="radio"/> 2 Bermuda | 30 <input type="radio"/> 2 Bermuda | 35 <input type="radio"/> 2 Bermuda |
| 27 <input type="radio"/> 3 Rye | 31 <input type="radio"/> 3 Rye | 36 <input type="radio"/> 3 Rye |
| 28 <input type="radio"/> 4 Other (please specify) _____ | 32 <input type="radio"/> 4 Fescue | 37 <input type="radio"/> 4 Fescue |
| | 33 <input type="radio"/> 5 Other (please specify) _____ | 38 <input type="radio"/> 5 Zoysia |
| | | 39 <input type="radio"/> 6 Other (please specify) _____ |

4. What is your facility's annual maintenance budget?

- | | |
|--|--|
| 40 <input type="radio"/> A More than \$2 Million | 44 <input type="radio"/> E \$300,001-\$500,000 |
| 41 <input type="radio"/> B \$1,000,001-\$2 Million | 45 <input type="radio"/> F \$150,001-\$300,000 |
| 42 <input type="radio"/> C \$750,001-\$1 Million | 46 <input type="radio"/> G Less than \$150,000 |
| 43 <input type="radio"/> D \$500,001-\$750,000 | |

5. If you work for a golf course, how many holes are on your course?
 47 A 9 49 C 27 51 E Other (please specify) _____
 48 B 18 50 D 36+

6. Are you the person responsible for golf car purchasing/leasing?
 52 A Yes 53 B No

7. Are you directly involved in purchasing decisions for your facility?
 54 A Yes 55 B No

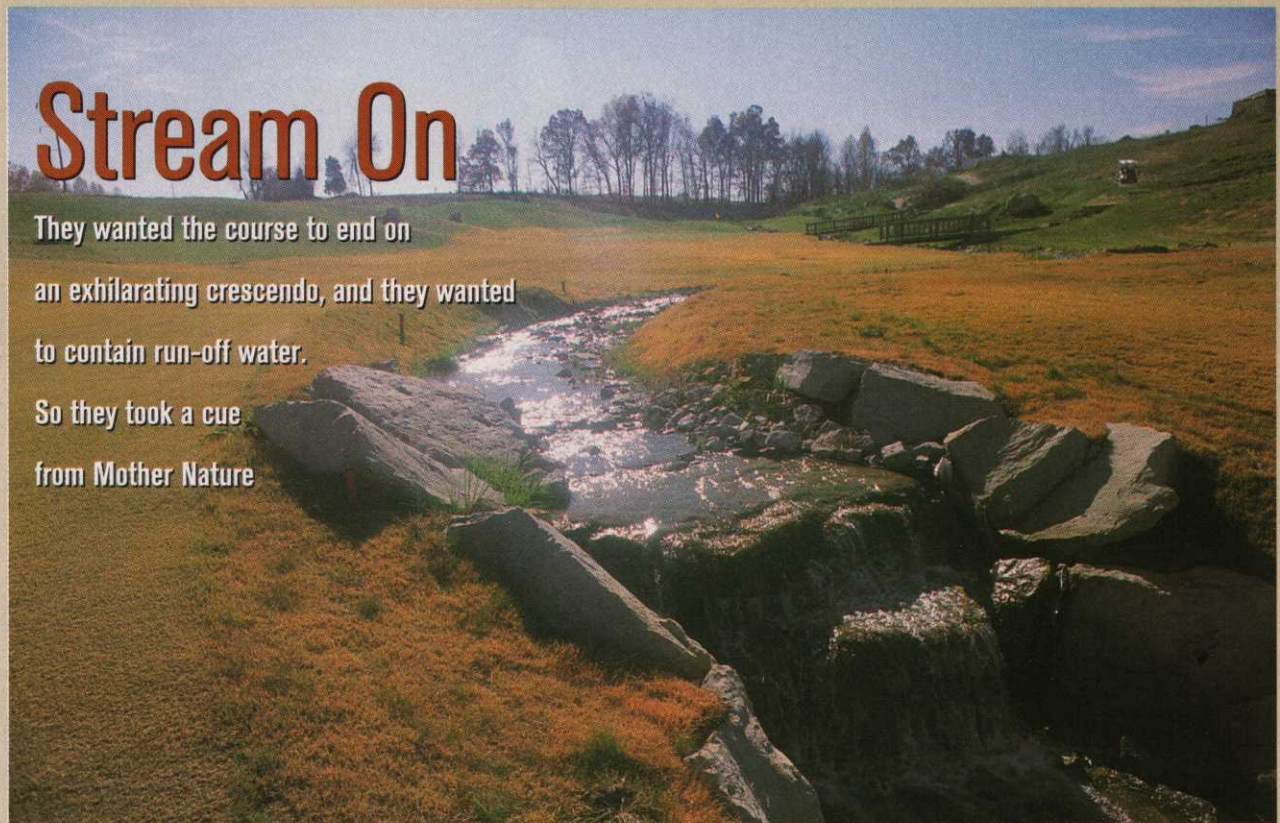
7A. If yes, which of these products do you specify, buy or approve?

- | | | |
|---|---|--|
| 56 <input type="radio"/> A Aerators (pond) | 71 <input type="radio"/> P Insecticides | 86 <input type="radio"/> 5 Sod |
| 57 <input type="radio"/> B Architectural Services | 72 <input type="radio"/> Q Irrigation Systems | 87 <input type="radio"/> 6 Soil Analysis |
| 58 <input type="radio"/> C Batteries | 73 <input type="radio"/> R Irrigation Parts | 88 <input type="radio"/> 7 Sprayers |
| 59 <input type="radio"/> D Biostimulants | 74 <input type="radio"/> S Landscaping | 89 <input type="radio"/> 8 Spreaders |
| 60 <input type="radio"/> E Construction Services | 75 <input type="radio"/> T Lubricants | 90 <input type="radio"/> 9 Tanks/USTs |
| 61 <input type="radio"/> F Chain Saws | 76 <input type="radio"/> U Mowers | 91 <input type="radio"/> 10 Tires |
| 62 <input type="radio"/> G Course Accessories | 77 <input type="radio"/> V Nematicides | 92 <input type="radio"/> 11 Tools |
| 63 <input type="radio"/> H Cultivation Equipment | 78 <input type="radio"/> W Pond Management | 93 <input type="radio"/> 12 Tree Care |
| 64 <input type="radio"/> I Drainage Supplies | 79 <input type="radio"/> X Pumps/Stations | 94 <input type="radio"/> 13 Turf Markers |
| 65 <input type="radio"/> J Erosion Control | 80 <input type="radio"/> Y Rakes | 95 <input type="radio"/> 14 Uniforms |
| 66 <input type="radio"/> K Fertilizers | 81 <input type="radio"/> Z Range Supplies | 96 <input type="radio"/> 15 Utility Vehicles |
| 67 <input type="radio"/> L Fungicides | 82 <input type="radio"/> 1 Safety Products | 97 <input type="radio"/> 16 Weather Systems |
| 68 <input type="radio"/> M Generators | 83 <input type="radio"/> 2 Sand | 98 <input type="radio"/> 17 Wetting Agents |
| 69 <input type="radio"/> N Golf Cars | 84 <input type="radio"/> 3 Seed | |
| 70 <input type="radio"/> O Grinders/Sharpeners | 85 <input type="radio"/> 4 Snow Equipment | |

101	113	125	137	149	161	173	185	197	209	221	233	245	257	269	281	293	305
102	114	126	138	150	162	174	186	198	210	222	234	246	258	270	282	294	306
103	115	127	139	151	163	175	187	199	211	223	235	247	259	271	283	295	307
104	116	128	140	152	164	176	188	200	212	224	236	248	260	272	284	296	308
105	117	129	141	153	165	177	189	201	213	225	237	249	261	273	285	297	309
106	118	130	142	154	166	178	190	202	214	226	238	250	262	274	286	298	310
107	119	131	143	155	167	179	191	203	215	227	239	251	263	275	287	299	311
108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	312
109	121	133	145	157	169	181	193	205	217	229	241	253	265	277	289	301	313
110	122	134	146	158	170	182	194	206	218	230	242	254	266	278	290	302	314
111	123	135	147	159	171	183	195	207	219	231	243	255	267	279	291	303	315
112	124	136	148	160	172	184	196	208	220	232	244	256	268	280	292	304	316

Case Study #2

MAINTENANCE



Stream On

They wanted the course to end on an exhilarating crescendo, and they wanted to contain run-off water. So they took a cue from Mother Nature

BY LARRY AYLWARD,
MANAGING EDITOR

They knew before construction that the 18th hole would be a popular meeting spot for run-off water, like McDonald's for teenagers on a Friday night.

Problem

Run-off water threatened to make an enormous sponge out of the 18th green at GreyStone GC in Dickson, Tenn. On top of that, the 18th hole lacked pizzazz.

Solution

Construction of a creek corrected the problem of run-off water and transformed the entire hole into an exciting golf experience.

The last hole at the McCumber Golf-designed GreyStone GC in Dickson, Tenn., which opened in September 1998, sat in a valley between two big hills. Welcome to watershed city.

The problem

The initial problem, of course, was run-off water, which threatened to make an enormous sponge out of the 18th green. But McCumber designers, including Jeff Lucovsky, determined that a storm drainage system would help solve the problem.

Still, there was another problem. The 18th hole was boring, like cheese pizza, and everyone knew it.

"You want to do something special on the 18th hole," Lucovsky says. "We

had a good set of holes, and we didn't want the 18th to be a letdown."

Superintendent Larry Arnold agreed. "It was a fine hole, but there was nothing interesting about it."

Lucovsky and his peers originally planned to install and bury an 18-inch drainage pipe running from the top of the hill behind the green along the length of the 450-yard, par-4 hole.

"But it wouldn't have been dramatic," Lucovsky admits. "It wouldn't have left you with that 'Wow' feeling when you walked off the 18th green."

And if the drainage pipe wasn't wide enough?

"If there was a storm that provided more water than the pipe could handle, water would wash down in

the fairway and greenside bunkers, creating a mess," Lucovsky says.

Like a fine classical music tune, Lucovsky and company wanted the course to end on an exhilarating crescendo. With a large buried pipe stretched along the 18th hole, there was nothing uplifting about the finish.

The solution

So one day, everyone headed out to the 18th green, including Lucovsky and other McCumber designers, the course's owner, John Duke (president of GreyStone Properties), and its builder, Bob Pinson (president of Course Crafters).

It was time to brain-

Continued on page 100

Case Study #2

Continued from page 99
storm about what could be done to spice up the 18th hole. Soon they were talking about building a creek to run along the right side of the hole, instead of buried drainage pipe. A stream, they agreed, would take the ho-hum out of the hole.

"The creek would not only beautify the hole and make it memorable, but it would be able to handle the drainage that would be naturally occurring between the two hills," Lucovsky says.

As fate would have it, the owner of the golf course, Duke, also owned a rock quarry next to the course.

"A lot of golf courses spend a million dollars on rock work," Lucovsky says. "Here, the rock was available to us for free."

Elements of the course, such as tees, already featured the rock. So building a creek from the same material was fitting and would match the rest of the course.

Outcome

Arnold, who joined Grey-Stone about six months before the course opened, was in charge of implementing the building plan and making sure "the creek looked like it had been there a long time." It took Arnold and six crew members about

three weeks to construct the creek. It was an intense job that required constant attention to detail.

"I spent a lot of time in that creek," Arnold says. "We worked slowly. We had to build waterfalls and get water to flow where we wanted it."

The creek is about 15 feet across from edge to edge. "It looks natural, like a babbling brook," Lucovsky says.

Even when it's not raining, the creek is running — fed by waters from a nearby lake used for irrigation and recirculated. A cart path runs to the right of the creek and five bridges were in-

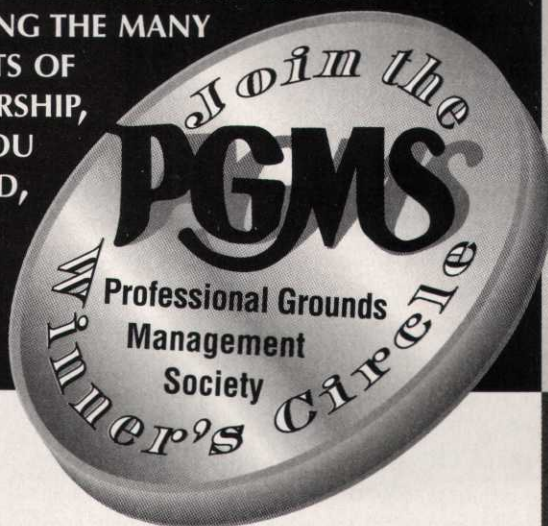
stalled along the hole so golfers could cross it.

"It has added immensely to the hole," Lucovsky says. "It has changed the entire complexion of the hole."

It has made the hole more challenging, Arnold says. The creek is about 20 feet to the right of the green, so there's not much room for a slice on the second shot.

At first, Arnold says he didn't like the creek. It appeared too new and manufactured after it was built. But after a good rainstorm — and a strong flow of water to muddy it up — the creek looked like the real deal, he says. ■

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