HELP YOUR BUNKERS MAKE THE GRADE

A guide to help you evaluate the factors affecting bunker performance.

by CHRIS HARTWIGER

"OUR BUNKERS are too soft! . . . Our bunkers are too hard! . . . Our bunkers are terrible!" These are comments typically heard at golf courses throughout the country. Whether or not you like the bunkers on your course, you can be sure there is at least one golfer who thinks the bunkers fail to make the grade. Bunkers by definition are hazards, and maybe this is why bunker conditions elicit so many strong opinions. After all, playing a recovery shot from a hazard usually is not a pleasurable experience.

Ask a golfer what he or she thinks about the bunkers on a golf course and you are likely to get an earful. Ask a golfer why the bunkers perform the way they do and you are likely to get a blank stare. Oh, they may be quick to tell you the bunkers need to be rebuilt, but they really do not understand bunker performance.

The first step in improving the condition of the bunkers on a golf course is to understand the factors that influence bunker performance. People have a tendency to look at a problem on a golf course and assign a single reason to why the problem occurred. After all, they reason, if one factor is identified for the poor performance, then one solution can be implemented to resolve the problem. In reality, bunker performance is related to a number of factors.

To develop a plan for improving the bunkers at your course, take the time to complete the Report Card for Bunkers. The Report Card discussed in this article will enable the decision makers at a golf course to understand bunker performance and develop a plan to improve many or all of these factors. It may not be possible to raise all the grades to an A, but raising the ratings one or more letter grades can make a difference.

Bunkers at thousands of golf courses throughout the country have been rebuilt because they were performing below expectations. In many cases, the factors that caused the bunkers to perform poorly were not remedied during reconstruction and, within a few years, the new bunkers were in the same unsatisfactory condition again. Taking the time to understand the factors that influence bunker performance and assessing those factors at your course will enhance the chances for a successful bunker program.

PHOTO BY ROBERT WALKER

Golfers desire a consistent bunker sand with no contaminants, such as clay or rocks.

Using The Report Card for Bunkers

Are your bunkers measuring up? If not, completing the Report Card for bunkers is an ideal first step in improving the bunker performance at your course. To achieve the best results, a rating team that includes the golf course superintendent, the golf professional, and key personnel within the club (e.g., Green Commitee, general manager, etc.) should be assembled.

Step 1: Assign an overall historical performance grade to the bunkers on each hole. Before heading out onto the course, the rating team should discuss the historical performance of the bunkers on each hole and assign a single letter grade from A to F. Make the decision whether or not to include fairway bunkers in this Report Card. Do not rate each bunker individually, but treat all the bunkers on one hole as a unit. This will simplify the process and will eliminate the cumbersome record keeping involved with rating each bunker individually. The historical performance grade represents an average over the last three or four years

At times, water accumulates in a bunker faster than the subsoil can absorb it. In sandy soils, no drainage system may be necessary, but in clay soils a properly functioning drainage system is a must.

and will provide a reference point for the other ratings on each hole. A grade of A reflects superior performance over this period, while an F reflects failure.

Step 2: Visit each hole to complete the Report Card and identify where changes should be made. Listed on the accompanying table are a variety of factors that should be rated. There is room on the Report Card to add additional factors at your discretion. The Rating Team should assign one letter grade from A to F for the bunkers on each hole. After 18 holes, the rating team should have a total of 18 ratings for each factor. The rating process is subjective and it is important for each individual to be consistent throughout the entire process. The rating process should take approximately three hours and should be completed in one day.

Step 3: Implement the changes. Implement as many of the changes as possible. Improving the factors that limit the success of the bunkers will make a difference in how they perform and play.

Factors Influencing Bunker Performance

The factors discussed below have a tremendous influence on how a bunker performs. Sample criteria for determining a grade are included with each factor. These criteria are not meant to be set in stone, but are a starting point for the rating team. It is quite possible the rating team will want to modify the criteria or add additional factors to meet the needs of their course.

Historical Quality: This category provides an overall assessment regarding the quality of the bunkers over the past several years. Has there been a uniform depth of sand in all parts of the bunkers? Are the bunkers properly raked each day? Is the sand quality satisfactory?

- A = Bunker conditions meet or exceed expectations all the time.
- B = Bunker conditions usually meet expectations most of the time.
- C = Bunker conditions meet expectations some of the time.
- D = Bunker conditions consistently fall below expectations.
- F = Bunker conditions never meet expectations.

Intensity of Daily Maintenance: The intensity of daily maintenance is one of the most important factors that influence bunker quality. The bunkers can be constructed according to the latest standards, but if routine maintenance is neglected, unsatisfactory conditions will be the norm.

Few people realize that when viewed on a per-square-foot basis, bunkers are the most labor-intensive part of the golf course. Routine bunker grooming provides a smooth, uniform playing surface for golfers. While routine grooming is time consuming enough, a heavy rain can wash the sand off a bunker face down to the low point in a bunker. Shoveling the sand back on the face is the only way to restore the face of the bunkers following a heavy rain. Another storm a day later will wash the sand off the face again and the repair process must be repeated.

Decision makers at every golf course must decide how intensively the bunkers will be maintained. The number of bunkers, the size of the bunkers, and design features such as flashed faces are all factors that must be considered when developing a daily maintenance program. How the bunkers are groomed and how frequently they are groomed will have a major impact on bunker quality regardless of the changes made to the bunkers themselves.

Some golf courses prefer to use a mechanical bunker rake, while others prefer to hand rake the bunkers. Hand raking is performed if the highest level of surface grooming is desired. Even if the sand in the bunkers is not the best quality or purity, hand raking is the method that provides the best day-to-day playing conditions.

The mechanical bunker rake was developed to allow the bunkers to be raked more efficiently, but there is a reduction in grooming quality with a mechanical rake. It can cause damage to the edges of the bunker and contributes to contaminating the sand. In all likelihood, this factor will be graded the same on every hole since it reflects the overall intensity of the bunker maintenance program.

- A = Bunkers hand raked daily; washouts repaired promptly.
- B = Bunkers mechanically raked daily; washouts repaired promptly.
- C = Bunkers hand raked daily; washouts repaired sporadically.
- D = Bunkers mechanically raked when time allows; washouts repaired sporadically.
- F = Bunkers raked when time allows; no consistent program for washout repair.

Steps to improve the grade in this category involve changing the grooming techniques and adding more manhours to bunker maintenance. Some courses find an immediate improvement in the playability of the sand by changing from mechanical raking to hand raking. Hand raking generally produces firmer playing conditions. Some superintendents retrofit their mechanical rakes with leaf rake attachments to simulate hand raking. This

modification reduces the tilling of the sand and helps to firm the bunkers.

If the bunkers are not raked daily, implementing a daily raking program is another way to improve the grade this category receives. The sight of freshly groomed bunkers each day makes a strong impression on the golfers. Raking daily eliminates unsightly footprints and other disruptions in sand.

Surface Drainage: The frequency and severity of washouts is directly related to the amount of water that runs into a bunker from the surrounding area. If the bunker has flashed faces, the washout problem will be even more severe. Repairing washouts is hard work and time consuming. Sand must be physically shoveled from the low points back up onto the faces *every time a heavy rain occurs.* Bunkers with flat bottoms have fewer problems with washouts, even though surface runoff from surrounding areas can create problems. Failing to repair bunkers properly after washouts creates inconsistent sand depths throughout the bunker. Washouts also contribute to sand contamination problems, shortening the life of the sand.

There are several ways to improve the surface drainage in and around bunkers. Consider installing interceptor drains at the base of a hill or slope that normally channels water into a bunker. Picking up water before it enters the bunker greatly reduces labor time needed to shovel sand back onto the faces.

Proper internal drainage is a must for a bunker to be successful in the long run.

If the bunkers are going to be rebuilt, consider building them with flatter bottoms and fewer flashed faces. Be forewarned that eliminating high sand faces will change the architectural integrity of the bunker. Nevertheless, if the course does not have the budget to properly maintain the high sand faces, then this may be an option to help improve the playability of the bunkers. Extending turf down steep bunker faces reduces the potential for washouts and improves the bunker quality.

- A = None of the bunkers on the hole have flashed faces; no surface water from surrounding areas flows into the bunkers.
- B = Fewer than 50% of the bunkers have flashed faces; no surface water from surrounding areas flows into the bunkers.
- C = More than 50% of the bunkers have flashed faces; only a few bunkers wash out severely from surface water flowing into the bunkers.
- D = More than 50% of the bunkers have flashed faces; surface water runs into many of the bunkers.
- F = Most bunkers have flashed sand faces; severe washouts occur in many of the bunkers from surface water running into the bunkers.

Flashed sand faces are dramatic architecturally, but when surface water is allowed to run into a bunker with a flashed sand face, washouts are inevitable.

Internal Drainage: From a maintenance perspective, overhead rain and irrigation water is the only water that should enter a well-built bunker. At times, water accumulates in a bunker

faster than the subsoil can absorb it. As a result, many bunkers have an internal drainage system to drain away excess water. In sandy soils, no drainage system or a poorly functioning system may be sufficient most of the time. In clay soils, a properly functioning drainage system is a must or the bunkers will look like swimming pools every time it rains.

The first step to improve drainage is to determine if the existing drainage system is functioning properly. If a drainage system exists, observe how well the bunker drains or does not drain following a significant rainfall. How long does the water remain in the bunker following the rain?

Poor drainage may be due to heavily contaminated sands or a drainage system that no longer functions efficiently. The rate of internal drainage affects the sand contamination rate. Puddling leaves contaminants on the surface as the water recedes. A properly functioning drainage system with clean sand in the bunkers reduces puddling and contamination. If no drainage system exists at all, it will be necessary to install a new drainage system in the bunker.

- A = Functional internal drainage in all of the bunkers on the hole.
- B = Functional internal drainage in 75% of the bunkers on the hole.
- C = Functional drainage in 50% or more of the bunkers on the hole.
- D = Functional drainage in less than 50% of the bunkers on the hole.
- F = Functional drainage in none of the bunkers on the hole.

Sand Purity: This factor measures the level of contamination in the bunkers. The presence of silt, clay, and organic debris in the sand can act as an impediment to drainage by reducing the infiltration rate of the bunker sand. Contaminated sand is often hard. The appearance of rocks in the bunkers is distracting and disruptive to play.

Little can be done to improve the purity of sand without taking out the old sand and replacing it with new sand. It is tempting to *top off* the bunkers with a few inches of new sand, but this process will not remedy the underlying problems. Within a short period of time, these new bunkers will look just like the old ones.

- A = Sand purity and contamination levels are acceptable.
- B = Sand purity and contamination levels are acceptable on 75% or more of all the bunkers on the hole.
- C = Sand purity and contamination levels are acceptable on 50% to 75% or more of all the bunkers on the hole.
- D = Sand purity and contamination levels are acceptable on 25% to 50% of all the bunkers on the hole.
- F = Sand purity and contamination levels are acceptable on none of the bunkers on the hole.

Sand Quality

The relative firmness of a bunker plays a key role in the playability of the bunker. Some players prefer firm sand, while others would opt for softer sand. Developing a grading scale for sand quality is difficult because it is such a subjective factor. The Report Card is a valuable tool to evaluate how bunkers are performing on the course. If the rating team decides that the sand in an ideally constructed and functioning bunker is undesirable, new sands should be evaluated. To learn more about how to select bunker sands, please refer to "How to Select the Best Sand for Your Bunkers" by James F. Moore in the January/February 1998 issue of the *Green Section Record*.

Conclusion

The performance of bunkers on a golf course is largely a function of architectural design, the physical properties of the sand, and the intensity of bunker maintenance. Although bunkers are classified as hazards and fall below greens, fairways, and tees in terms of maintenance priority, the topic of bunker performance is discussed frequently at courses everywhere. Before making a quick decision that the only way to improve the bunkers is to rebuild them, complete the Report Card for bunkers. Evaluate the factors that influence bunker performance at your golf course and implement programs to improve them. After six months, repeat the Report Card program and compare the results. The time invested in completing the Report Card for bunkers and learning what factors influence bunker performance will pay big dividends as a club makes a decision about upgrading the quality of its bunkers.

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Report Card for Bunkers

Report Card for _____ Date Completed _____

Factor	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Historical Performance																		
Intensity of Daily Maintenance																		
Surface Drainage																		
Internal Drainage																		
Sand Purity																		
Overall Quality (average of factors above)																		
Historical Performance																		