



Beauty and the Blast

Good surface drainage keeps sand clean.

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A bunker is an integral part of a golf course, creating a hazard that is unique to the game. It is defined in **The Rules of Golf** as an area of bare ground, often a depression, which is usually covered with sand.

This sand is of special importance to all who are interested in the management and maintenance costs of golf courses.

Bunkers are important to golf; their beauty in contrast to the deep green color of turf is appealing as well as challenging. They can also be a costly maintenance item. How costly depends upon a number of factors.

SIZE

There is no regulation regarding size, the "pot bunker" well placed is as effective as any larger bunker—it's all part of the architect's plan. Large bunkers are eye catching, yes, even spectacular; few, in fact, will argue that the larger ones add to the general beauty of the golf course more so than smaller ones. One wonders, however, if beauty is sometimes considered over their value as a hazard. There is one thing for sure—the larger the bunker, the more costly it is to rake and restore it to its original smoothness after a day's play.

PITCH

Bunkers vary in facing; some are steep with

little or no lip, others are level and there is every conceivable in-between variation. Most are faced-up to the front, that is in the direction of the putting green, and they taper gradually to the rear and finally even out to the turf level. No rule applies: the architect usually prevails. Some bunkers are sloped on two, three, or even four sides, and after rainstorms or heavy play, the more facings and the steeper its banks, the more man-hours are required to restore the sand to its original condition.

NUMBER

There is no set rule with regard to number. We have seen good courses that are almost devoid of bunkers, but the champion of our experience is a course in New Jersey that has 254 individual bunkers on 18 holes. Is there any question that this course will require a larger work force than any course with fewer bunkers? During a recent conversation with a superintendent and Green Committee member whose course has an average number of bunkers, the superintendent stated that his bunkers cost as much to maintain as his greens. The committeeman's startled reaction was a questioning and disbelieving W-H-A-T??? Labor is the major cost of the golf course operation, and a course with emphasis on sand is going to be costlier to maintain than the course that com-

Sand piled in Firestone Country Club parking area. It will be used in 66 bunkers on the new North Course. The 4,120 tons represent a lot of future manhours raking sand for pleasurable golf.



bins a fair share of tree and grass hazards with sand.

SIZE OF SAND PARTICLES

Size contributes to softness or compaction of sand and whether it will footprint excessively or not. Sand that contains a large percentage of gravel tends to compact more readily, allowing the ball to sit up, but when exploded onto the green, this type of sand creates problems in mowing and putting. Maintenance men always try to remove the gravel by poling before mowing, but this is sometimes difficult when greens are wet with dew. Those that escape poling are sometimes cleanly picked up in mowing; **sometimes they are not** and this means more grinding, more adjusting of mowers, more time lost or consumed **NEEDLESSLY**. Players always take time to remove these particles from their line for the obvious reason that they deflect the putt. Incidentally, have you ever noticed any golfer removing a pebble from his line, placing it in his pocket or discarding it **far off the putting green**? Most simply toss it a few feet away **ON THE GREEN** for the following players to move it again, and again, and again. Here and now we make a plea for golfers to pick up any obstruction on greens, pocket it, and toss it into a trash receptacle at the first opportunity. Player assistance is not only welcome, but

CORDIALLY INVITED!!!

Preferably, sand in bunkers should contain no particle over 1-1/4 mm. and none less than 1/4 mm. The largest percentage should be in the 1/2 mm. to 1-1/4 mm. size. This is especially important for courses located where sand is subject to wind erosion. Sand in bunkers should be of similar texture as sand used for topdressing soil mixtures. For a fine article on sand particle size we refer you to the article by Charles Wilson of the Milwaukee Sewerage Commission that appeared in the September 1968 issue of the **USGA Green Section Record**.

DEPTH

Depth of sand is important to maintenance. Excessively deep sand causes unnecessary softness resulting in deeper footprinting. This also adds to costs. The rule of thumb of most superintendents is to introduce or keep sand to a settled depth of four to six inches. To compute the amount of sand required, it takes 37-1/2 cubic yards of sand to cover 2,000 square feet to a depth of six inches. The deeper the sand, the deeper the ball will bury, the more frequently will a "fried egg" result. Depth of sand on facings and slopes is critically important to maintenance. When a ball buries on an inclined plane, the golfer disturbs more sand, sets his feet deeper and the deeper he has to dig to

make the shot. It takes time and a strong arm to re-level the sand on the sloped faces. Most golfers don't have the time to give it anything but superficial attention, so these deep prints are left for the maintenance crew to repair properly. Some superintendents believe in minimizing depth on slopes to approximately two inches so that the ball hits and rolls to the bottom of the trap.

DRAINAGE

Surface and internal drainage are always of Paramount Importance, just as it is on any area of the golf course. Bunkers that have good drainage seldom get dirty with clay sifting up through the sand when they are flooded. As with greens, surface and internal drainage are important, but *surface drainage will cure a lot of ills if properly done*. Good surface drainage means that the pitch is so slight and so subtle that the sand doesn't move, but the water does. When deep bunkers are built they must have tile or gravel drains that effectively lead the water out. Special provision must be made that drains in deep bunkers remain functional. Too often they quickly clog with sand and become unwelcome, unplanned ponds.

In summary, sand maintenance is costly! There is a point at which the hazard ends and luxury maintenance begins. It really boils down to how much your club is willing to pay for aesthetics.

If budget is a critical factor, it would be well to study the bunker situation carefully and eliminate the superfluous traps (those out of play and those that handicap poorer players only), cut down on the size of excessively large ones, improve internal and surface drainage,

check pitch of bunkers that require excessive man-hours to restore sand to its original condition, and carefully measure the depth of settled sand. Excessive use of sand wastes valuable budget dollars.



Rains cause sand erosion on slopes.

Highly frequented bunkers cause turf to deteriorate when an accumulation of sand results from endless explosion shots.

