

## MANAGEMENT OF GOLF COURSE BUNKERS

By Stewart Brown

**There is probably no other hazard that causes as much comment or interest than the sand bunker. When bunkers originally evolved on the Scottish links land, they were nothing more than irregularly-shaped sandy pits. The development of the game on differing types of terrain enabled golf course architects to design different types of bunker. Today a bunker can constitute many differing forms, from a little-changed traditional 'links pit' to vast expanses of sandy scrub that sometimes occupy an area the length of a hole.**

The maintenance techniques used to keep the hazards on a particular course visibly appealing will, therefore, differ – so will the equipment and the amount of labour necessary.



A poorly maintained and constructed bunker. The golfers nightmare!

### DESIGN AND FUNCTION

The earliest designs of bunkers were fashioned by early designers on links courses from irregular shaped naturally-occurring depressions that have been fashioned by the shifting winds over the area, traffic and animal scrapes.

As golf became more popular and interest spread inland to the heath lands and parklands, the earliest golf course architects tried to copy the naturally-occurring shapes of bunkers. The form and shape were quite often nothing like the natural hazards and were often representations

of the designer's interpretation. Earth-moving and shaping equipment was poor and primitive and resulted in a poorly shaped oval sand pit that shared no resemblance to the original concept. As time went on the design, shape and size of the original animal-scraps hazard evolved into what it is today.

Materials and equipment used for bunker construction developed and we now have highly individualised concepts and constructions for bunkers. The interest shown by golfers, designers and golf clubs has changed over the years with bunkers falling in and out of fashion on a regular basis; with courses adding, changing, styling and removing bunkers to individual holes to add interest, design and appeal. Not only will the style of golf course influence the shape and size of a bunker, but also the placement of a bunker on the course will influence the way it is played and viewed.

The three main placements for a bunker on a golf course are:

#### The Fairway

- Often quite large in size with a shallow base
- Common shapes include rectangle, yawning, freeform and jigsaw
- Easy to play out of with a longer club
- Visible from the tee
- Penalty value is low
- Maintenance value medium

#### The Approach

- Smaller than the fairway bunker
- Common shapes include yawning, oval and jigsaw
- Usually deeper than fairway with a definite step down into the sand
- Play is restricted to medium to short irons
- Requires more skill on behalf of the player
- Penalty value medium
- Maintenance value medium

#### Greenside

- Usually smallest of the types available
- Moderately deep, if not the sand, the sides
- Common shapes include pot, oval and jigsaw
- Often arranged in numbers of two - four around

- the green edge guarding the surface
- It is often the number of bunkers as opposed to the size that causes the player to fault
- Extremely visible
- Penalty value high
- Maintenance value high



Large freeform fairway bunker.

The use of a particular style of bunker will also be determined by the use the bunker is being put to.

This can be:

- Strategic – Defining shot values
- Retaining – Keeping balls from worse fates
- Safety – Stopping errant shots and protecting tees, golfers, buildings
- Directional – Helping to define play direction
- Aesthetic – Adding harmony, style and cosmetic value

Bunkers certainly add to the aesthetics of a golf course and appropriate maintenance is an important part of the brief for every course manager and greenkeeper. It is also important that all hazards on the course are fair, ie:

- Bunker faces are complete and free from overhangs
- Bunker bases are shaped to avoid downhill lies
- Rear lips are graded to prevent unplayable lies
- There is a uniform depth of sand in all hazards
- The sand and its playing characteristics are the same right the course

Poor bunkers are often characterised by exhibiting the following features:

- Excessive depth of excavation (inland) – impervious clay or stony subsoil exposed
- Inadequate depth of excavation (links) – sand susceptible to wind-blow
- Bunker too narrow – limits backswing and follow-through
- Formation of excessively steep bunker faces – problems of sand retention and undercutting of front lip of bunker
- Abrupt step between fairway and sand at the entrance
- Inadequate drainage – clay subsoil
- Selection of wrong sand type
- Omission of geotextile membrane on stony sites

## CONSTRUCTION OF BUNKERS

There are a number of important factors to be considered when bunkers are being constructed. The location is usually dictated by an architect in order to provide strategy and playability, and to add visual impact to a hole. However, other factors such as soil type, degree of exposure to the elements and natural land contours must be considered if the hazard is to fulfil its envisaged function. Bunkers should be well constructed and designed so that they drain freely, are (preferably) visible and influence play 'positively'. On links land, the need for protection from wind erosion will keep sand areas low.

On links courses where the inherent conditions are free-draining, there is no need to install additional drainage in the base of the bunker, although it is advisable to check the natural winter water table, and to keep above this if possible. It is usually sufficient to excavate the area to the desired shape, remembering that depth is important on exposed sites in order to prevent wind blowing sand from the bunker.

On inland sites where free-draining soils are the exception rather than the rule, problems with drainage can develop if the construction is inadequate. Because of the impermeable clay sub-soil that often exists on parkland sites, inland bunkers must be built up rather than excavated as they are on links land.

In addition, it is usually necessary to install drainage in the base of the bunker to prevent ponding during wetter periods of weather, and to ensure that external ground contours shed rather than gather water.

## BUNKER SAND

Playing quality is frequently the most subjective evaluation criterion of bunker sands. Players vary widely in their assessment of what constitutes good playing quality. One of the few agreed opinions seems to be a desire for all bunkers on the course to play in a consistent manner. For this reason, when adding sand to existing bunkers, it is good practice to perform the work on all bunkers on the course. Sands often change significantly in their playing quality over the first few months as they become compacted and contaminated with soil and organic debris.

Newly-installed sand may seem soft at first, but soon will become more firm. The speed at which this firming occurs depends on the angularity and particle sizing of the sand, as well as raking practices. There must be sufficient depth (100mm/4 inches) of 'clean' sand (lime-free on inland sites) within the bunker and the surface layers should be maintained in a loose condition over a firmer base. Ideally, the majority of particles should be within the range 0.125 to 0.5mm (seaside) or 0.25 to 1.0mm (inland) and angular in shape.

Light or tan coloured sands are preferred for definition and contrast. The sand should form a central depression which will gather the badly-placed shot, yet will still allow sufficient room for backswing and a full follow-through to effect a satisfactory recovery shot. There must be a smooth transition in contouring between the surrounding turf areas and surface of the sand, with sharp definition. The sand should be kept free from weed growth or stone.

From a testing standpoint, particle size, particle shape, crusting potential, and infiltration rate all provide insight as to how the sand will play. However, other factors that have nothing to do with the makeup of the sand have equal if not greater impact on playing quality.

## MAINTENANCE TASKS

Bunkers require high levels of maintenance to keep them in top condition. To this effect bunkers can become the most labour intensive area on the golf course, requiring far more day-to-day maintenance and management than the greens and tees combined. A commitment to a high level of bunkers on any

course should not be a decision taken lightly. On most established golf courses in the United Kingdom bunker maintenance should be relatively straightforward. Increasingly, however, modern design techniques involve the creation of bunkers that are far more time-consuming to maintain. Nevertheless, basic bunker maintenance involves the following main tasks: Raking, Sand replacement, Mowing and strimming, Weed control, Bunker repair/renovation and Sand replenishment.



Some bunkers need a lot of raking!

## CONCLUSION

The amount of time spent on bunker maintenance will depend upon the number of bunkers on the course and the shape and contouring around them. Most existing bunkers on long established courses are of regular shape, with subtle, yet manageable, contours around them. Some labour intensive work is inevitably required but in most cases this is not excessive. In contrast, however, some newer developments have gone for the more 'grandiose' style bunker, visibly formidable for the golfer but even more formidable for the staff that have to maintain them! Fingers of sand and extensive steep slopes can make the maintenance of these hazards a far more time consuming task.

Bunker management is reasonably straightforward provided that maintenance is not neglected over a long period. There are, however, more and more courses where bunker maintenance is very time consuming – this must be recognised and time allocated to it if problems are to be avoided in the future.

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**Count on it.**