
MT
LOFTY
GOLF
CLUB

Bunker Report
September 2007

Turfwise Consulting

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Mr David Perry
Course Chairman
Mt Lofty Golf Club
PO Box 20,
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September 1st, 2007.

Dear David,

Thank you for the opportunity to meet with yourself and Chad Dawe (Course Superintendent) on Thursday to discuss the difficulties you are encountering with bunker maintenance.

The purpose of this report is to highlight the strategies necessary to improve the condition and sustainability of the bunkers throughout the course.

The Issues

From discussions on course and my own observations, the main issues regarding the condition of the bunkers are;

Drainage

- This is influenced by the ability of water to move down through the sand profile away from the bunker playing surface, and then to a drainage system that removes the water completely.
- In the bunkers that were examined, the depth of sand was inadequate (often only 50-100mm), with strong evidence that existing subsurface drainage was not functional.

Surface hardness

- This is directly related to the ability of the sand to dry out, with excessive moisture retention leading to compacted bunker floors that limit the ability of the golfer to get their club through the sand and under the ball.

Maintenance time

- Due to the constant battle with poorly drained sand profiles in many of the bunkers, a disproportionate amount of time is required to be spent preparing the bunkers to an acceptable standard.
- This issue is compounded by the rainfall, topography, soils and surface and subsurface water movement through the golf course that consistently challenges the drainage of the bunkers.
- Bunker raking is performed by hand, and when conditions are ideal, can be completed in one hour by three staff members. When bunkers are wet from irrigation or normal course drainage, or damaged by rain events, routine bunker maintenance can take between 3 and 5 hours for three staff members.

Presentation

- Bunker presentation is compromised due to the limited time resources available for maintenance due to the factors listed above.
- Presentation is further compromised by the constant depositing of leaf litter, and the reduced maintenance focus allowing weeds to establish readily throughout the bunkers.

Resources

Mt Lofty Golf Club employs three full time green keeping staff. Taking into account normal working conditions (38 hour working week, annual leave, sick leave etc), this allows for a budget of approximately 5,350 human resource (HR) hours per year, or approximately 103 HR hours per week.

Raking is performed by hand, as the club does not own a mechanical bunker rake.

Review

The following is a review of the bunkers throughout the course following the inspection that was conducted on August 30th.

Hole 2

- 2 bunkers on the right hand side of the green
 - Primary function is ball retention on the steep slope
 - Very narrow bases and sharp corners, unsuitable for mechanical raking
 - Subject to frequent saturation and excess leaf litter
 - First bunker requires difficult, long bunker shot, potentially slowing play

Hole 3

- This bunker was not inspected as the club has already decided to remove it.

Hole 5

- 2 bunkers short right of green
 - Strategically important, and visually well sited
 - Some loss of integrity from original design
 - Narrow bases with sharp corners, unsuitable for mechanical raking
 - Generally adequately drained

Hole 6

- 2 bunkers at front right of green
 - Strategically important and visually impressive
 - Some loss of integrity from original design
 - Left hand bunker possibly large enough to accommodate mechanical bunker rake with some modification
 - Right hand pot bunker suitable for hand raking only
 - Both bunkers consistently wet with inadequate depth of sand and questionable sub-surface drainage performance.

Hole 7

- One bunker short left of green
 - Helps to protect 8th tee
 - Evidence of poor drainage in lower sections
 - Able to be raked with mechanical rake due to width of base
- One bunker front right of green
 - Strategically important and visually well sited
 - Loss of integrity from original design
 - Poor playability, very steep face, with bunker floor promoting downhill lies
 - Inadequate depth of sand (25mm)
 - Very narrow base suitable for hand raking only

Hole 9

- One bunker short right of green
 - Strategic value
 - Primary role ball retention
 - Loss of integrity from original design
 - Inadequate depth of sand with poor drainage performance

Hole 11

- One bunker front right of green
 - Strategically important and visually well sited
 - Loss of integrity from original design
 - Generally well drained
 - Suitable for hand raking only

Hole 15

This bunker was not inspected as the club felt recent drainage improvements have been successful.

Hole 17

- 1 bunker short right of green
 - Primary function is ball retention
 - Loss of integrity and poorly drained
 - Very narrow base suitable for hand raking only
 - Requires difficult, long bunker shot, potentially slowing play

- 1 bunker at front right of green
 - Strategically important and visually well sited
 - Added function of ball retention
 - Some loss of integrity

- Generally well drained
- Narrow base suitable for hand raking only

Hole 18

- 1 bunker short left of green
 - Strategically important and visually well sited
 - Some loss of integrity
 - Pot style bunker suitable for hand raking only
 - Inadequate depth of sand

Routine maintenance of the existing bunkers can take up to 3-5 hours for 3 staff members, and ideally would be performed twice per week, utilizing as many as 30 HR hours per week. This represents close to 30% of the HR hour budget, and is far in excess of a suggested sustainable benchmark figure of less than 10% for routine bunker maintenance. Practices such as edging and refurbishment also need to be taken into account.

Summary

In considering the factors limiting the presentation and playability of bunkers, I offer the following comments.

Mechanical bunker raking can be an effective means of improving bunker maintenance efficiency, but requires bunkers to be constructed to accommodate them. This typically involves the creation of a minimum bunker base width of approximately 4 metres. In considering the topography throughout the course, creation of such bunkers would be a large scale and expensive exercise.

Due to the local climate, soil types and topography, the bunkers are heavily reliant on drainage to provide a sustainable playing surface. A systematic approach to upgrading drainage in all bunkers needs to be developed through

increasing the depth of sand and replacing or refurbishing sub-surface drainage systems.

Clearly there is a disproportionate amount of time required to maintain the current bunkers to an acceptable standard. Even with improvements in drainage and the limited scope to develop bunkers that can accommodate mechanical raking, it is unlikely that the existing bunker numbers can be sustained based on current staff levels, especially when numerous bunkers serve primarily as ball retention features.

Recommendations

For bunkers to be a sustainable feature of the course at Mt Lofty Golf Club, the following is recommended.

Hole 2

- Remove both bunkers and replace with grass hollows and mounds to serve as more sustainable ball retention features.

Hole 3

- Removal as decided by the club.

Hole 5

- Retain both bunkers but refurbish through increasing sand depth and upgrade sub surface drainage.
- Retain as bunkers sustainable with hand raking

Hole 6

- Retain both bunkers but refurbish through increasing sand depth and upgrade sub surface drainage.
- Retain as bunkers sustainable with hand raking

Hole 7

- Retain both bunkers but refurbish through increasing sand depth and upgrade sub surface drainage.
- The right hand bunker requires significant modification to increase bunker base area, which would allow for an increase in depth of sand, but retention of overall bunker depth and levels, as well as modifying the bunker face to improve playability (i.e. reduce penal nature of this bunker).
- Retain as bunkers sustainable with hand raking.

**It is recommended that the refurbishment of the bunkers on holes 5, 6 and 7 be carried out as "Stage 1" of bunker upgrades due to the relatively minor work required and immediate impact they would have.*

Hole 9

- Replace bunker with drained grassy hollows to achieve same ball retention feature. Such a complex would allow for an increase in the width of the line of play approach to the green, and still retain access to the 10th tee between the hollows and the adjacent lake.

Hole 11

- Retain bunker but refurbish through increasing sand depth and upgrade sub surface drainage.
- Retain as bunker sustainable with hand raking

Hole 15

- Monitor performance of modifications already made

Hole 17

- Remove first bunker and replace with grassy hollows and mounds to serve as more sustainable ball retention features.
- Retain second bunker but refurbish through increasing sand depth and upgrade sub surface drainage.
- Retain as bunker sustainable with hand raking.

Hole 18

- Retain bunker but refurbish through increasing sand depth and upgrade sub surface drainage.
- Retain as bunker sustainable with hand raking.

Chipping green

- Retain bunker but refurbish through increasing sand depth and upgrade sub surface drainage.
- Retain as bunker sustainable with hand raking.

These recommendations would see a reduction in bunker numbers to 11 overall (10 on the course and 1 at the chipping green). With sound construction (see notes below) and routine maintenance, it is expected this approach will see routine bunker maintenance requiring between 4 and 9 HR hours per week, even during winter, with the result being vastly improved playability and presentation of fewer bunkers.

This reduction is seen as a more desirable approach to improving the playability and presentation of bunkers than directing even more capital and maintenance resources towards bunkers that may be maintained mechanically, and takes into account the site, climate and available resources.

Due to the limitations of the site in allowing the creation of a significant number of bunkers able to be raked mechanically, it is not thought justifiable for the club to purchase a bunker rake for the very limited gains that may be made.

Notes on bunker construction

- Sand selection is crucial. Specific testing can be conducted and take into account optimal depth based on typical drainage requirements (i.e. rainfall)
- Ensure sub surface drainage is functional, and where possible, water is directed away from "in play" areas and potential for reuse considered.
- In general, it is recommended sand faces be avoided. Given rainfall levels, sand can wash from clay faces readily, adding to maintenance requirements.
- Consider rolling turf down bunker faces or the use of revetting as alternatives.
- Any sand faces should utilize one of the sand retention mats available now to minimize sand movement.
- In general, keep bunker base areas to a minimum without compromising playability, but reducing routine maintenance requirements. The influence of a bunker can still be considerable if it is well sited, and its surrounds act to gather balls in close proximity.

I trust this information is of some benefit. Please do not hesitate to contact me should you have any further questions.

Sincerely

Daryl Sellar M.Agr (Turf Mgt)

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