



## Kingsknowe Golf Club

### Greens – to re-construct or not to re-construct?



Kingsknowe Golf Club is an 18-hole parkland golf course, located on the western side of Edinburgh. The original course was laid out by Alec Herd, the 1902 Open Champion, in 1908 before being re-designed by the famous golf course architect James Braid in the 1920's. The course, renowned for its tree-lined, dog leg holes and rolling terrain, is a Par 69, 5,938 yards in length and offers an enjoyable yet challenging golfing experience for players of all abilities.

### The Challenge

- Dating back to the mid to late 1990's Kingsknowe, like many other courses was suffering from a prolonged regime of over-watering, over-feeding and a lack of adequate aeration, scarification and top dressing. The soil based greens were not allowing water to percolate through the soil profile at acceptable rates causing flooding and puddling.
- This resulted in an accumulation of spongy thatch being evident within the soil profile to depths of up to 100 mm, causing severe moisture retention during the wetter periods and a consequent lack of root development for grasses on the putting greens.
- Annual meadow-grass dominated the majority of greens with bent grasses restricted to the peripheries and on sections opposite the walk-off areas.
- Thatch levels resulted in poor root development, generating a weaker overall turf susceptible to golfer traffic wear, frost damage and intolerance of dry weather.
- Greens were very susceptible to disease and fungicide applications were frequent, c. 6-8 per annum.
- Greens were, therefore, invariably in poor condition during the Winter, Spring and early Summer months, providing members and visitors with a short playing season when the course was of a good playable standard. Greens invariably flooded during periods of wet and inclement weather.
- **The initial challenge for Kingsknowe GC was to establish whether the greens could be managed back to firmer, drier, free draining soil profiles where the right environment could be created for the finer grasses to re-establish themselves.**



# Sustainable Golf Course Management Project



SCOTTISH GOLF  
UNION



SCOTTISH LADIES'  
GOLFING ASSOCIATION



WORKING FOR GOLF

## The Solutions

- Firstly, the club provided the full backing and resources to the Head Greenkeeper and his team to tackle the challenge of reducing thatch levels on the greens.
- Thatch reduction was identified and agreed as the key priority to regenerate quality putting surfaces across the course at Kingsknowe GC.
- Intensive coring, scarification and top dressing work was conducted across all greens on the course to dilute the thatch content.
- In addition deeper aeration (Verti-draining) was conducted on the worst affected greens in conjunction with working in a subsequent top dressing.
- Minimal water and fertiliser was applied – just sufficient to keep the grass alive.
- Overseeding greens with bent grasses, particularly to the weaker areas.
- Greens were closed throughout the Winter months to give them a rest from golfer traffic.
- Green approaches were maintained to same standard as the greens to provide alternative green positions during the wetter Winter months.

## The Outcomes

Whilst some greens certainly improved in their firmness, this was only the initial stage of the investigation and there remained significant levels of thatch within many of the weaker greens – some now broken up by sandy top dressing layers but in others up to 75 mm of thatch remained in the softer, annual meadow-grass dominated sections.

## Golfing Benefits

- Following the intensive aeration/top dressing work the club was able to open many of the greens to play during the Winter months once again – however, the weaker greens still had to be taken out of play during periods of wet weather.

## Economic Benefits

- Reduced fungicide requirement has positive impact on the greens budget.

## Environmental Benefits

- Grass cover overall was vastly improved, with a higher proportion of bent grasses, due to the overseeding work implemented by the club.
- Reduced incidence of disease occurring on the greens, requiring less fungicide input.

## The Success Criteria

- Reduction in the levels of thatch underlying the greens - establishing drier, firmer, freer draining putting surfaces.
- Reduction in the incidence of disease occurring and consequently a reduced requirement for fungicide application.
- The Committees commitment to managing the disruptive impact of the thatch reduction program in conjunction with member and visitor golfer's expectations.
- Reduction in the number of days that the main greens were required to be closed over the Winter period – moving towards implementing a policy of only closing for frost and snow.
- Reduction in the annual meadow-grass content within the species composition across all greens, with increasing coverage of the deeper rooting finer bent grasses.

## What Next?

The greens at Kingsknowe GC, with a continuing annual meadow-grass content, gave acceptable putting surfaces for the majority of the Summer months, however, these conditions -particularly on the weaker greens - were compromised by the first signs of any Winter rain. A heavy presence of clay at a depth of 200 mm also severely restricted the free passage of water through the soil profile. With low natural evaporation cycles during the Winter months this resulted in saturated, anaerobic soils - an environment conducive to thatch accumulation, rather than thatch break-down.



These significant thatch levels created a comfortable and desirable environment for shallow rooted grasses such as the annual meadow-grass to flourish and the vicious cycle becomes self-perpetuating – re-generating wet, stagnant green profiles that in turn promote high annual meadow-grass content.

**The next step was therefore for the club to decide whether the greens needed to be re-constructed to a high quality, free draining, USGA recommended method of construction or whether to battle on with what could only be described as limited success in attempting to prolong reasonable course conditions during a shortened playing season.**

## The Secondary Challenge

- As a result of a number of the weaker greens on the course unlikely to respond sufficiently to the intensive aeration and top dressing programme - the club decided to re-construct the greens to USGA recommendations and to phase the programme over a number of years, reconstructing one or two greens each year.
- Greens to be re-constructed using USGA recommended drainage and rootzone, re-laying the original turf back into position after removing all debris and thatch accumulations from the turf profile.
- To create minimal disruption to play whilst greens were being re-constructed – putting specified traffic routes in place for both golfers and contractors working on site.
- Creating a safe environment for the contract work to be undertaken.
- Bunker re-construction to be added to the green re-construction specification, reinstating the original principal's nose bunker design historically common to Kingsknowe GC.
- Greens to be managed to the objectives contained within the Kingsknowe Greens Policy.

## Extract from the Kingsknowe GC Greens Policy 2007:

### 3. Greens (including practice putting greens)

#### Objectives

- Firm and free draining surfaces throughout the year.
- Greens cut to no less than 4mm
- Uniform and even surfaces giving a smooth ball roll.
- Dense sward with a high percentage of bent grasses.
- A pace of 7 to 8 on the stimpmeter. Readings to be done directly after the morning cut on the same 3 greens.
- Healthy root zone conditions to promote the finer grasses
- Freedom from disease.
- Aprons to be clearly defined from greens and to be cut to 10mm

**Note:** Kingsknowe GC's revised, current policy is to achieve a pace of 8' to 10' on the stimpmeter.

## Additional Solutions

- Greens were prioritised for re-construction, with one or two greens being tackled each year, working from the weakest green towards the healthier greens.
- The club created its own specification for the re-construction of greens to USGA recommendations, which was offered to all contractors tendering for the job.
- All materials to be used in the reconstruction were independently tested to verify their quality and suitability for the re-constructions.
- The Head Greenkeeper was appointed Project Manager for the re-construction project – due to being on site every day and able to monitor and record progress accurately.
- Temporary greens were prepared in the same manner as the full greens, up to 6 months in advance of the re-construction work commencing – giving high quality alternatives during the re-construction phases.



- The club's major competitions were brought forward in the competition calendar, particularly in the years when two greens were to be worked on that year.
- On-going agronomy advice procured to assist before, during and after the re-construction – and to advise on the bedding-in of the new greens, once reconstructed.
- Fencing was erected to separate the contractor's site from the in-play areas, maintaining a safe environment for both activities to run concurrently.

## Final Outcomes

- The re-construction programme has been a success rejuvenating the weaker greens at Kingsknowe GC – both in relation to their free draining properties and also their grass cover - producing very acceptable putting surfaces soon after re-construction. Although each USGA recommendation green required a completely separate maintenance regime over its early months.

## Golfing Benefits

- Enhanced performance from the newly constructed sand based greens – these greens were historically the worst conditioned greens but are now free draining and no longer close the course during periods of wet weather.
- The newly constructed greens are now widely accepted by both the greenstaff and the members as the best performing greens on the golf course throughout the year.
- The safety considerations put in place for the contractors allowed the re-constructions to operate unhindered and golf to be played by the members simultaneously.
- Where turf was relayed early enough in the growing season, i.e. before the end of August, greens were sometimes back in play within 8-10 weeks.

## Economic Benefits

- The existing turf knitted well back onto the re-constructed greens, allowing greenstaff to manage the bedding-in, rolling etc. of these greens in-house, post re-construction.
- A tangential benefit of the green re-construction was that the excess soil removed from the old greens was utilised to expand two of the courses smaller hillside tees. The contractors moved the soil (c. 1,000 tonnes) whilst on-site working on the greens, with the greenstaff then finishing off - putting on the same rootzone as the greens and re-turfing these new teeing areas themselves.

## Environmental Benefits

- Roots were re-establishing themselves within 2-4 weeks of turf being relayed.
- Re-layed turf had been managed to a relatively high bent content within the sward as a result of the intensive coring and top dressing activities undertaken before re-construction.
- Damage to the course was limited by careful planning of contractors entry and exit points on and off the golf course.

## The Success Criteria

- The number of greens was completed according to plan – within timescale and budget.
- New greens dry, firm and free draining, dominated by the finer grasses – primarily bent.
- Consistency across re-constructed greens for the enjoyment of members and visitors alike.
- The golf course being open for play much longer into the Winter months.
- Temporary greens use is only required for periods of frost or snow, where a USGA recommendation green is now in place.

# Sustainable Golf Course Management Project



SCOTTISH GOLF  
UNION



SCOTTISH LADIES'  
GOLFING ASSOCIATION



WORKING FOR GOLF

## What Next?

- The club is committed to continuing the programme of greens re-construction until all 18 greens have been re-constructed to USGA recommendations.
- The current economic climate has meant a sabbatical year from re-constructing any further greens during 2008/9 - until the club understands what the impact, if any, of next years membership numbers may be.
- As the Head Greenkeeper has been actively involved in the 11 greens re-constructed to date the club are considering re-constructing the next greens in-house – this has multiple benefits:
  - overall cost savings for the re-construction.
  - allows the Head Greenkeeper and staff the opportunity to re-construct greens to USGA recommendations.
- The remaining traditional greens will still be maintained ensuring thatch reduction is the key priority, through aeration and top dressing techniques – this will help promote a healthy bent dominated turf ready for re-laying on the newly constructed greens.