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KØBENHAVNS GOLF KLUB

AGRONOMY REPORT ON THE GOLF COURSE

Date of Inspection – 30 March 2010

1.0 PRESENT

- 1.1 The course was inspected with Mogens Nielsen and Martin Nilsson.
- 1.2 Matters arising were discussed with Birgit Peitersen and Steen Christian Pedersen.

2.0 BRIEF

- 2.1 To carry out a review of course condition and resources for maintenance.
- 2.2 To comment upon findings and to make recommendations for future action.

3.0 REVIEW

3.1 Course condition

An especially cold winter, with long term snow cover encouraging disease attacks, has had a very bad impact on the 18th green and the practice putting green, and has caused significant scarring on the 1st and 17th as well. However, the damage seen on other putting surfaces was generally superficial and was expected to recover quickly when growth gets underway. Disease under snow has had only a small impact on other sections of the course, including the new turf laid during Phase 2 of the course renovation project.

The course renovation project on green surrounds, bunkers and tees is now complete, but there is still a lot of work to do before the club will have the finished product. Nevertheless, I hope that by the second half of the summer you will be 80-90% of the way there on the main course, and I anticipate just fine tuning in 2011. In contrast, the objective for the practice course is basic usability in 2010; here, the establishment of new grass has been particularly poor to date.

The results achieved from the ongoing surface management programme have also been very positive. The fundamental condition of the putting surfaces at the majority of holes is now good to excellent, while greens described as weaker than the norm, such as the 1st, 3rd, 8th and 17th, are still making headway. The 5th and 6th have made especially good progress

during the past year. Only the 18th and the practice putting green were disappointing.

Turing to other sections of the course, I was especially pleased to hear it has been possible to carry out vigorous vertidrainage of the fairways during the winter. I fully expect the turf here will be much stronger in coming weeks as a result. As emphasised on the day, I think vertidrainage should be a routine treatment applied to all fairways every year, as a base operation to ensure that all other treatments will be fully effective. Looking to the future, I envisage the club intensifying the treatment programme for fairways even further, to ensure the average standard of presentation will be at a similar level to greens, surrounds and tees.

3.2 Resources and equipment

No new points were made concerning machinery or irrigation. However, with respect of staffing levels I suggested that if the club is to maintain the momentum of the course renovation project, and is to continue to present the course to a good standard as routine, then I think you will need at least six greenkeepers during the coming spring and summer.

4.0 GREENS

4.1 Update

The greens at the 2nd, 4th, 5th, 6th, 7th, 9th, 10th, 11th, 12th, 13th, 14th, 15th and 16th were in good to excellent condition, with only minor damage due to snow mould and hoof marks from deer. Here, the turf mixture is dominated by Festuca and Agrostis, and while there is some Poa in places (e.g. at 11th and 15th) this is not of a type that indicates is a fundamental problem with structure or growing environment. There were a few patches of weeds, e.g. at 9th, but again these were not obtrusive.

Beneath the turf, thatch was under good control at a norm thickness of 1 cm, and root extension was generally good to a depth of 10 cm and beyond. There were no soil compaction issues. Indeed, the only small defect found within the make up of these greens was a sandier layer around 5 cm from surface level, which is a feature to be aware of, particularly when deciding upon whether or not to include hollow tining in the annual programme.

On other greens, my observations were:

- At the 1st, there is still a much higher population of Poa, but there are increasing amounts of Agrostis and Festuca. Because there is more Poa, snow mould has had a more significant impact and there were scars that will need repairs. Below ground, there was no excess thatch, but root growth continues to be shallow, to a maximum depth of 5 cm, because of an especially thick sand layer that needs special attention through hollow tining and the addition of Axis.
- The 3rd green continues to be weak along the left side, but now that tree root pruning has been carried out I expect stable improvements during the coming summer, following spring renovation.

- The mix of grasses on the 8th is much better than was the case two years ago, but still this green is thinner and mossier than the average because the very sandy rootzone does not retain the same amounts of fertiliser and water as soil based greens. Short term treatments with iron sulphate and/or lawn sand will help to check the moss, while further strengthening of the ground cover will come through improvements to water balance and an increase in cation exchange capacity via the introduction of Axis with hollow tining.
- The 17th in general is progressing nicely, but the low spot in the centre of the green where water retention is too high continues to be a Poa area that was scarred by disease. The plan here is to improve drainage by cutting in deep sand channels at 0.5 m intervals, but bad weather has prevented the implementation of this project to date. I understand this is now earmarked for autumn/winter 2010/11.
- The Poa dominated putting surface at the 18th was heavily scarred by snow mould damage, illustrating how important it is to manage the turf type on greens when there are severe limitations to chemical control of pathogenic fungi. The growing environment at the 18th is such the potential for establishing Festuca species is low, but still it should be possible to add a good percentage of Agrostis, which means that when there is disease damage it will be not so acute and recovery will be much quicker. Nevertheless, it will still be important to try to improve the growing environment here as well, and with this in mind I was pleased to hear tree root pruning has been carried out. The boring in of sand channels is planned, but again this has had to be deferred until the end of the year. The soil beneath the 18th was still very hard and sticky.
- The situation of the practice putting green is even worse than the 18th and damage levels were acute. The line for improvement here is the same as at the 18th. Where it has been possible to drill out some sand channels to date the soil was certainly looser beneath. Also, tree root pruning has been completed. Repairs to scars were underway and the best that can be done with respect of additional treatments will be to apply extra fertiliser from time to time, as needed to restore and maintain completeness.

4.2 Assessment

The technical results being achieved from the ongoing management programme are very much in line with expectations and the results are less than perfect only where there are defects in the growing environment.

When discussing plans for 2010 we talked particularly about verticutting and hollow tining:

- Verticutting is applied to thin out the turf on greens if this becomes too dense, as was the case at the 14th, which is fine.
- Given a finding that more greens than just the 1st have a sand layer within the top 5 cm of the soil profile, I think all greens should be hollow tined on one occasion during the year, in summer. However, selected greens will still need to be hollow tined more frequently (see below).

Turning to special work on selected greens I advised:

- Best results from overseeding with Agrostis alone on weaker greens will be achieved June-September when the soil is warm. When overseeding in spring, I think it is a better bet to use a mixture of Festuca and Agrostis.
- The 1st, 8th, 18th and practice putting green will benefit from the addition of Axis in conjunction with hollow tining in both spring and in summer, at a rate of one bag per 50 m², applied prior to top dressing and overseeding. Similar operations will be valuable at the left side of the 3rd and in the centre hollow of the 17th.
- While the 1st will benefit from extra 4.0.8 fertiliser this spring to help recovery, if the response to similar action at the 18th and the practice putting green is poor, here use Scotts' 6.5.10 mini granular at 35 g/m² at four week intervals to promote a full recovery.
- With respect of the planned Drill and Fill procedure at the 17th green, I still think you should cut in larger diameter tubes, as described previously, on a 50 cm grid. On the 18th and on the practice putting green, if cutting out narrow channels on a 20 cm grid is too labour intensive, widen this out to 50 cm in the first instance; we can consider intensifying this in local areas if needed at a later date.

5.0 PUTTING SURFACE EXTENSIONS

5.1 Assessment

Extensions to close mown putting surface have been made at several holes as part of the course renovation project. Where these areas have been re-established using turf from the old practice greens the results have been excellent, e.g. at the 4th, and here it did not appear any special action is required.

With respect of putting surface extensions established with turf from the UK in 2008/9, for the most part these seem to be developing as expected and should be maintained as normal green during the coming spring and summer. If there are any scuffed spots, carry out spot hollow tining, then press down to reduce bumps. If there are any low spots, build these up with repeated spot top dressings. If the grass starts to thin out (as at the 1st in 2009) do not raise the height of cut unless the problem becomes really serious. Instead, focus on overseeding at four week intervals and supplying extra fertiliser. If 4.0.8 fertiliser is not sufficiently positive, use 6.5.10 Scotts Greenmaster Autumn.

For the imported turf laid in 2009/10, this will need mowing separately in the first instance, using a hand mower at 8 mm. Smooth out these zones with repeated top dressings and supply an extra 4.0.8 or 6.5.10 fertiliser as routine every four weeks to keep the grass growing strongly, and overseed frequently. As smoothness improves, step down the height of cut in 1.0 mm stages until this matches in with the remainder of each putting surface. Treat

any scuffed areas as above by hollow tining and pressing down. Aim to have these areas in routine maintenance by July.

Carry out hollow tining of the extension areas from 2008/09 this spring and work Axis into the open holes prior to top dressing. Do not carry this out on the extension areas laid in 2009/10, where root growth is still not strong enough. These latter places will be in the plan for 2011.

6.0 GREEN SURROUNDS

6.1 Assessment

The foregreens and surrounds that were re-laid in 2008/9 have established well, but still need to be smoother and firmer if mowing is to be tight and uniform. As such, rolling was required, followed by top dressing with sand on the widened foregreens on three or four occasions. The same procedure will be required on the new surrounds laid in 2009/10, with a view to bringing all these areas to a similar standard by the latter part of the summer. If, even after rolling and top dressing has been carried out, there are still places that are scalped, then these spots will need to be stripped, reshaped and returfed in autumn/winter 2010/11.

The programme envisaged for the ongoing development of surrounds and foregreens is:

- At the earliest opportunity when the turf is dry but the soil is moist, carry out rolling with a combination of the available equipment, including the Greentek rollers, the Greens Iron and/or heavy mower units to firm and smooth the turf. Make passes in 2-4 different directions.
- At greens where the surrounds have not been redeveloped (such as the 12th) carry out hollow tining, overseeding and top dressing of the foregreens.
- At the earliest opportunity apply green surround and foregreen fertiliser as planned, using the Scotts' 24.2.9 at 20 g/m². Repeat this treatment on the foregreens if needed in summer.
- As growth gets under way cut all the surrounds and foregreens at an initial height of 15 mm, covering both the areas re-laid in 2008/9 as well as those re-laid in 2009/10. Box off clippings.
- When there is steady growth apply a generous sand top dressing to the foregreen areas and work it in with the mat. Repeat after an interval of 3-4 weeks.
- After the first two top dressings, reduce the height of cut on the foregreens to 12 mm.
- After a further 3-4 weeks apply a third top dressing to foregreen areas.
- Once the third top dressing has been absorbed, reduce the height of cut on foregreens to 10 mm, and regard this as the minimum for 2010. The target for 2011 will be 8 mm on foregreens.

- While the new turf is being developed, it will be important to prevent it becoming stressed in dry conditions. Depending upon the weather, it may be prudent to focus the irrigation system on surround areas and place an emphasis on hand watering of the putting surfaces for the time being, as was reported to have been done last summer.

7.0 TEES

7.1 Assessment

Established tees seen were in satisfactory condition. New tees laid in 2009/10 were soft and needed work to perfect surface smoothness. The requirement was for rolling, verticutting and top dressing, followed on by fertiliser treatment using Fairway Master Mini 24.2.9. No other points were made concerning tee maintenance.

8.0 FAIRWAYS

8.1 Assessment

The fairways were coming out of the winter with a basic grass cover. There was quite a lot of hoof print damage, but this did not seem too severe and it was expected that as mowing begins the fairways will soon roll out to a reasonable level of smoothness. Scarifying with the Veemo's was planned once growth is underway. Good.

As noted earlier, I was very pleased to hear that it has been possible to vertidrain the fairways with a heavy duty machine over winter. As advised, I think this should be a basic treatment for the fairways, because it is crucial to their long term viability. Vertidrainning maintains good surface drainage and cultivates the ground to create a healthy growing environment.

Looking to the future, once the full benefits of the course renovation programme show through, I think it is likely the fairways will be seen as areas for specific improvement. The best way forward will then be to introduce a top dressing programme using sand. Inevitably, this will be costly, so it is something to plan for. There are more benefits to be gained from top dressing than overseeding.

9.0 BUNKERS

9.1 Assessment

The renovation programme has made a good impact on the bunkers. I was pleased to note too that better sand has now been installed, which is much more stable.

10.0 PRACTICE COURSE

10.1 Assessment

The new greens sown in May 2009 have not established well. The bulk of the putting areas were thin and bumpy, and have been damaged by the deer, while marginal areas were often very bare, with just loose rootzone

exposed. This is not an irretrievable situation, but it will call for a lot of work to put it right. The sequence of operations envisaged is:

- To lift out the hoof marks.
- To smooth out the bare areas by raking and then carry out rolling to bring all places to uniform firmness.
- To dress through with a mixture of seed and top dressing for further smoothing and to strengthen the grass cover. Extra seed (Agrostis and Festuca) will be needed on the marginal bare places.
- To apply Scott's Autumn 6.5.10 fertiliser at 50 g/m². Repeat this treatment on two or three occasions until the new grass is well through.
- To keep the rootzone moist by irrigating daily (or even 2-3 times per day) whenever the weather is rain-free. Continue to irrigate in this fashion until the grass is well through, the surface has stabilised, and you can carry out routine mowing at, say 12-15 mm.

Throughout the spring and summer, keep irrigation and fertiliser input at a generous level until the turf is well established. Step down the height of cut slowly in stages, applying top dressing to ensure surface smoothness is brought to optimum trueness at each stage. Aim for a minimum height of cut of 8.0 mm this year.

A further area to be reseeded is the driving range, but this just required normal procedure involving: cultivations; surface smoothing and firming; seeding; and fertiliser applications.

11.0 NEXT VISIT

11.1 Proposal

I suggest a further review of course condition at a similar stage in 2011. Nevertheless, if I can be of further assistance in any way in the meantime I hope the club will be in touch.

D M STANSFIELD
13 April 2010