Bloxwich Golf Club

ASSESSMENT OF COURSE DRAINAGE, JANUARY 2022

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BLOXWICH GOLF CLUB

ASSESSMENT OF COURSE DRAINAGE
Inspection Date 18 January 2022

1.0 PRESENT

1.1 The course was inspected with Michael Plimmer, Peter Gutteridge, Paul Williams and Alistair Botwood.

2.0 BRIEF

2.1 A fundamental element within the Club's long term plans for the golf course is to invest in optimum playability year-round. As things stand, winter usability can be adversely affected by spells of heavy rain leading to lingering zones of casual water and areas of instability/muddiness, and this is seen as a potential area for improvement.

2.2 The purpose of this report is to evaluate how course drainage can best be improved for the long term, taking in the potential need for: localised and overall new drain installation; drain repairs; ancillary works; and supplementary surface management operations.

3.0 THE COURSE

3.1 This challenging parkland course is close to 100 years old, originally established on former farmland, judging from the presence of gentle ridge and furrow contouring and old field boundaries.

Photo 1: Ridge and furrow contouring

3.2 The fairways carry very good quality, mature turf, generally springy underfoot. All areas seen were comfortably walkable in mid-winter, although the lower sections of the 9th and 18th that were reported to have a high potential for flooding were somewhat softer than the norm. Scattered muddy patches were noted here and there, principally associated with zones of concentrated worm casting. Nevertheless, there was also wet/muddy turf associated with a small number of slow running or blocked drains.

Photo 2: Very good quality, mature turf dominates the fairways

3.3 Of late, work has been carried out to rectify excess wetness due to a damaged drain or drains on the upper part of the 18th fairway, with apparent success both above and below ground. Indeed, it was evident similar works carried out in the past to overcome other examples of lingering wet ground conditions have been equally successful and indeed some have contributed to an enhancement of the course (e.g. the attractive pond at the 4th/5th). I noted though, where new drains have been installed and have settled to a degree, there is a good case for dressing out to restore surface smoothness and uniformity (as planned).

3.4 Areas that were unstable underfoot were primarily in the green surrounds at the 11th and 16th. I did not see extensive roping off to protect wet ground from trampling.

3.5 Existing course drainage relies on a system of ditches to carry ground water off-site. It seems there have been more ditches in the past, but a number have been (hopefully) piped and filled in. Of the remainder, it was evident these are well maintained on a regular basis. All were flowing freely and outfalls were clear.

Photo 3: Well maintained, free-flowing ditches were seen throughout

4.0 THE SOIL

4.1 Sampling of the topsoil indicated the overall presence of a good depth (150-250 mm) of friable material that for the most part was uncompacted, merely moist and free of any mottling to suggest a fluctuating water table. This latter feature was only obvious in what tend to be the wetter parts of the 9th and 18th.

4.2 The friable nature of the topsoil to a 250 mm depth points to the regular implementation of an effective aeration programme to optimise the inherent drainage characteristics of the soil, as does root depth and exploration, which were both excellent. The subsoil beyond 250 mm was tighter (as would be expected) and, in comparison with the topsoil, more slowly permeable.

Photo 4: Sampling indicates the presence of a good depth of topsoil

Photo 5: The soil is generally friable, has a good colour and permits extensive root exploration

4.3 A sample of typical topsoil was collected for tests, the lab reports on which are attached in Appendix 1. The results indicate:

- The soil type is a sandy silt loam, within which fine sands are the major component.
- The particle size make-up allows for rapid percolation of ground water through topsoil that is in good structural condition. As such, if surface water lingers, this is because it is being prevented from entering the soil quickly by a surface barrier, e.g. excess thatch, or there is back-up from an impediment to flow further down the line, e.g. an absence of drains or dysfunctional drainage.
- Inherent fertility is low. This is good for golf because it provides an environment for grass types best suited for fairways, e.g. in terms of slow regrowth, tight lies and drought tolerance.
- The soil is significantly acid, but still within the range considered most suited to the ideal type of turf for golf fairways. Adjustment of the soil pH is highly inadvisable because this will greatly increase casting worm activity and weed invasion.
- Phosphorus availability is very low. I do not see this as an issue for mature turf forming a complete cover; routine inputs will be more of a disadvantage than a benefit. Occasional, one-off treatments only may be needed to help the establishment of new grass from seed or turf, or locally to promote recovery from heavy wear.
- There are adequate supplies of potassium and magnesium for the turf type on the fairways. Routine inputs are not required here.
- Soil organic matter is within the normal range for topsoil. This will not cause a high degree of water retention. Where organic matter is hindering infiltration of rainwater is on top of the soil, rather than within it.

4.4 Overlying the topsoil is a layer of thatchy organic matter around 50 mm thick. While this will give the turf a springy feel in dry conditions, in wet weather it will inhibit infiltration of ground water, slowing percolation into the soil and promoting run-off to low points that will form pools that are slow to disperse. The build up of such thatch is inherent in the nature of the turf and is promoted by the acidity of the topsoil.

Photo 6: A thick thatch layer impedes infiltration of surface water

4.5 This thatch layer is at its thickest and wettest where it is associated with localised topsoil compaction in the wet zones of green surround at the 11th and 16th. Underneath this 100 mm layer of locally damaged soil the ground was just moist and friable, not saturated. There was no sign whatsoever of spring water coming up from lower levels.

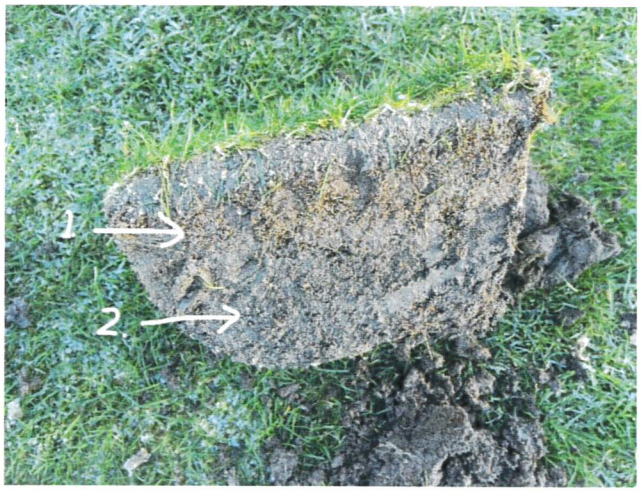

Photo 7: Saturated thatch (1.) over wet, compacted topsoil (2.) at the 16th

4.6 A similar depth of wet thatch was also found over saturated but uncompacted, mottled soil in what are often the wetter, low-lying parts of the 9th and 18th.

5.0 DRAINAGE ASSESSMENT

5.1 All the indications are the course in general is comprehensively drained by pipes that predate the use of the site for golf, supplemented over the years by local additions put in:

- When ditches have been covered over;
- Where an old drain has collapsed or become blocked by tree roots;
- Where there has been persistent surface water as a result of collected run-off;
- As part of works on greens, tees and bunkers.

5.2 My view overall is that the underlying system is working well on this type of ground and there is nothing to justify the high cost (say, £500,000 plus) of installing a replacement system throughout, and then enhancing it with a system of secondary drains. Secondary drainage and possibly local sand capping are likely to be necessary if you are to bring the drainage of the course up to the level of a sand-based site and would at least double the cost of a new pipe system alone.

5.3 A more appropriate approach to enhancing drainage throughout the course will be to intensify surface maintenance to make the initial infiltration of rainwater much faster. As I see it, your basic issue is not that the drains present are inadequate, but that ground water does not get to them quickly enough, primarily because there is an excess build-up of thatch between the grass and the topsoil.

5.4 To bring about thatch reduction, I recommend adding an intensive scarification programme to the treatment plan for fairways in both spring and late summer, using a machine that will closely follow contours to minimise the risk of ancillary damage. Looking at what tractor-mounted equipment is on the market, I think the best option is the Sisis Veemo Mk 2 triple unit, although the Graden Swing Wing could be trialled as well. You might have a first go in coming weeks by bringing in a contractor with a Veemo to do this for you, before investing in a new machine. ALS provide this service. See:

https://www.sisis.com/veemo-mk2

https://gradenturfmachinery.com

https://www.alscontracts.co.uk/services/turf-renovation/scarifying

5.5 Note though, scarification by itself will not be a universal panacea. There will be places where extra operations are required because thatch build up is too heavy to be managed by scarification alone. Here it will be necessary to improve the underlying growing environment as well, to tip the balance between thatch build up and thatch breakdown.

5.5 First and foremost in this respect will be to continue to repair drains that are not working, as per current plan, and to add more drains where none apparently exist at present. The case in point in this latter respect are the low lying zones of the 9th and 18th fairways, where no drains could be found on the day. Given the depth and nature of the topsoil here, I do not think you need take a very sophisticated approach to drain installation (e.g. Turfdry) or indeed wrap the drains in geotextile (which can block up with time). An outline to be adopted by the Club's staff using a hired trencher, or by a local drainage contractor with turf experience, might be:

- Carry out a level survey to determine the best lines of fall to outlet main drains into nearby ditches.
- Connect into this a grid of lateral drains at c. 6 m intervals.
- Lay 100 mm diameter perforated plastic pipe to a minimum depth of 600 mm along even falls of 1:100 min. Cut the trenches to allow for 50 mm of gravel on each side of the pipe. There is no need to bed the pipe on a layer of stone.
- Backfill the trenches with 10-12 mm stone (or Lytag) and blind with very coarse sand or fine grit.
- For preference, allow for return of 100 mm of topsoil and returf. It is likely though a contractor will want to place a sand/soil mix and reseed, which will take some time to re-establish a complete cover.

5.6 Turning to the wet green surrounds at the 11th and 16th, here there are drains, but damaged soil is further impeding downward percolation of ground water in addition to a very thick thatch layer. Past experience suggests the best cure will be to strip off the turf and thatch, cultivate the exposed soil, mixing in extra sand, and then returf with fresh material. However, as discussed, you could try hollow tining or vertidraining and working in heavy dressings of sand in the first instance, when ground conditions permit.

5.7 When you have a scarification programme underway, if you find there are local areas that are not progressing fast enough you will need to back this up by hollow tining or vertidraining, and then sand top dressing, as a late season operation, carried out either in house or by contractor. For example, you may need to follow up the drainage proposed at the 9th and 18th in this way, where the thatch is especially heavy.

5.8 Lastly, also affecting the apparent drainage qualities of the course are patches of concentrated wormcasting. See Photo 8. As things stand there are no good treatments to resolve this issue, nor is something really effective likely to appear in the future. There are soil conditioners you can apply to discourage worm casting, e.g. Purity or TAG can have a very short term effect, but they are no means guaranteed to work and are expensive. As such, given the scale of the problem, my suggestion is simply to top dress these places with gritty sand as and when necessary, and to consider overseeding in spring where the grass is particularly thin.

Photo 8: Superficially, heavy wormcasting can have the appearance of poor drainage

6.0 CONCLUSION

6.1 I did not see a requirement for a high cost, course-wide infrastructure project to ensure/enhance the year-round playability of the site long-term. The bulk of necessary improvements can be achieved with an intensification of the annual maintenance plan, backed up with in-house operations that are a normal level of repair and renovation. New investment in drains is needed only on a very localised basis.

D M STANSFIELD
26 Jan. 22

Lancrop Laboratories

Analysis Results (SOIL)

Customer DAVID STANSFIELD LTD

Distributor DAVID STANSFIELD LTD
13 FELL VIEW
EMBSAY
SKIPTON
BD23 6RX

Sample Ref BLOXWICH G C - TOPSOIL

Date Received 20/01/2022 (Date Issued: 25/01/2022)

Sample No E391800/01

Crop GRASS GROWTH

Analysis	Result	Guideline	Interpretation	Comments
pH	5.1	6.0	Low	Low. An acidic environment will reduce soil nutrient availability and the efficiency of any applied fertilisers or organic materials. A sub-optimum pH will also impact on soil microbial populations and rates of activity. Refer to lime requirement.
Phosphorus (ppm)	6	16	Very Low	**(Index 0.6)** 120 kg/ha P2O5 (96 units/acre).
Potassium (ppm)	44	121	Very Low	**(Index 0.7)** 120 kg/ha K2O (96 units/acre).
Magnesium (ppm)	83	51	Normal	**(Index 2.6)** Apply 25 kg/ha MgO (20 units/acre) every three to four years.
Org. Matter - DUMAS (%)	5.4	3.0	Normal	Good. Soils with medium to high levels of organic matter would generally be expected to have a good potential fertility and good structure, moisture retention and water infiltration. Ensure appropriate soil management practices are used to maintain organic matter levels.
Lime Req. (t/ha)	6.0			

Additional Comments

The analyses and interpretations for P & K have been carried out in accordance with RB209. PLEASE NOTE: The recommendations should be adjusted if organic manures are used. See RB209 for more information.
Where applicable soil applied P,K and pH recommendations are taken from AHDB Nutrient Management Guide (RB209)

Any indicated Lime Requirement assumes a medium textured soil.
Additional technical bulletins are available at www.lancrop.com.

Please Note

Whilst every care is taken to ensure that the Results from Analysis are as accurate as possible, it is important to note that the analysis relates to the sample received by the laboratory, and is representative only of that sample. No warranty is given by the laboratory that the Results from Analysis relates to any part of a field or growing area not covered by the sample received. It is important to ensure that any soil, leaf, silage or fruitlet sample sent for analysis is representative of the area requiring analysis and that samples are obtained in accordance with established sampling techniques. A leaflet containing instructions on how to take soil, leaf, herbage, silage and fruit samples for analysis is available from the laboratory on request. Uncertainty measurements of results are available on request

Released by Chris Lindley.....Laboratory Manager on behalf of Lancrop Laboratories

Lancrop Laboratories

Analysis Results (SOIL)

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13 FELL VIEW
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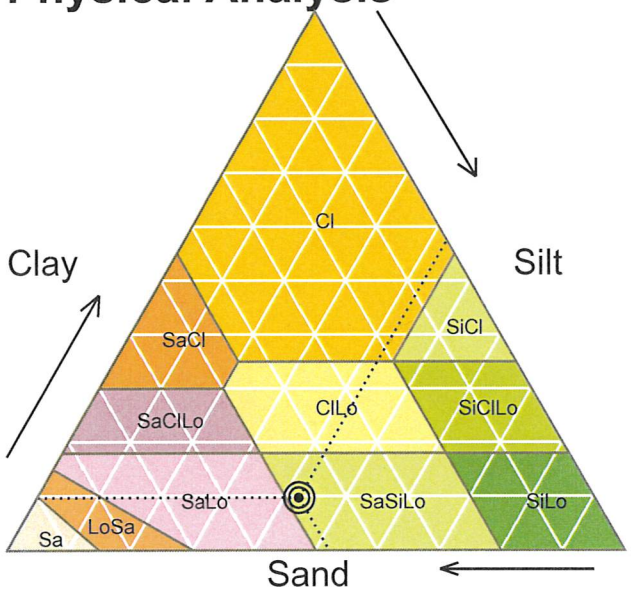
Sample Ref BLOXWICH G C - TOPSOIL

Date Received 20/01/2022 (Date Issued: 25/01/2022)

Sample No E391800A/01

Crop GRASS GROWTH

Physical Analysis



Analysis	Result (%)
Sand	47.82
Silt	42.45
Clay	9.73
Very Fine Sand	17.58
Fine Sand	19.81
Medium Sand	9.85
Coarse Sand	0.58
Very Coarse Sand	< 0.01
Stones >2mm	6.00
Soil Type	SaSiLo Sandy Silt Loam

Property	Assessment
Available Water	Low to Medium
Drainage Rate	Rapid
Inherent Fertility	Low to Medium
Potential C.E.C.	Low to Medium
Leaching Risk	High to Moderate
Warming Rate	Rapid

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