



Making great sport happen



HAGGS CASTLE GOLF CLUB

Advisory Report on the Golf Course incorporating the STRI Programme

Report Date: 31st August 2017
Consultant: Richard Wing



Haggs Castle Golf Club

Date of Visit: 25th July 2017

Visit Objective: To review the prevailing condition of the course, take further objective measurements from the indicator greens and confirm ongoing maintenance requirements.

Present: Mr Scott Ballantyne – Course Manager
Richard Wing – STRI Ltd

Weather: Sunny - 16°C

Headlines

- The course was in excellent condition with sharp presentation considering the wet condition throughout the summer.
- The pipe drainage installed to certain greens (e.g. 10) is having a very positive effect on the playing surface performance.
- Surface firmness was in target to the greens despite wet weather conditions.
- Organic matter content of the greens profile from 0-20mm has seen a slight increase and is above the ideal target range.
- The wet conditions through the summer are starting to cause some issues with wear on high traffic routes.

Key Actions

- Continue with the plan to install further pipe drainage to greens.
- Increase sand top-dressing inputs to 150 tonnes per annum to dilute the slight increase of organic matter in the top 20mm.
- Additional work through hand top-dressing to further refine the surface along the drain lines.
- Overseed the greens with 100% browntop bent seed to further improve the consistency of the sward composition.
- Initiate winter traffic management as early as possible to reduce further damage to traffic routes.

Objective Measurements

Measurement	Average	Target Range
Soil Moisture (%)	37.9% (range 36.0-40.2%)	15-30%
Hardness (Gravities)	100 Gravities (range 97-106 g)	85-110 g
Smoothness (mm/m)	19.9 mm/m	<25 mm/m
Trueness (mm/m)	10.3 mm/m	<8 mm/m
Green Speed	10 ft 5 in	9-10 ft
Organic Matter 0-20 mm (%)	8.5 %	4-6%
Organic Matter 20-40 mm (%)	4.0 %	<4%
Soil pH	4.7	5.0-6.0
Phosphate (P ₂ O ₅)	4 mg/l	>10 (mg/l)
Potassium (K ₂ O)	37 mg/l	>30 mg/l

Key:

In Target

Marginal Variance

Out of Target

Photo Observations and Comments



Figure 1: The course was in good condition and presented with excellent definition of the playing surfaces. The use of pedestrian mowers on the greens and the first tee give an excellent visual first impression.



Figure 2: The greens displayed a good grass cover with a good botanical composition and sward texture.



Figure 3: The greens presented green speeds higher than ideal for tournament play and therefore the height of cut could be raised slightly to reduce the stress on the grass plant.



Figure 4: The soil profiles show a good consistent amelioration of sand. A slight build-up of organic matter in the top 20mm is notable.



Figure 5: The installation of pipe drainage to greens has had a positive effect on both surface firmness and moisture content. The lines are still visible and when intersecting a putt still effecting the consistency of the ball roll.



Figure 6: The repair work carried out on green 2 is still visibly a different sward to the remainder of the green. This should be moved to the edge of the green and future plugging work should use turf of a similar botanical composition such as the putting green.

Photo Observations and Comments (continued)



Figure 7: The par 3 11th tee is subject to high levels of divot damage. Widening the teeing area will allow for extra tee positions to give a greater chance of recovery.



Figure 8: The par 4 15th tee is also subject to high levels of divot damage with most players using an iron. With limited space to spread the damage recovery is limited during the season.

Recommendations

Greens

- The organic matter content in the top 20mm of the profile has slightly increased and is at an excessive level. Sand top-dressing inputs should be raised to achieve a minimum 150 tonnes per annum to dilute the increased accumulation. This should be achieved through a combination of regular light dressings.
- In order speed up the process of organic matter reduction, the increase in sand top dressing could be combined with a Graden sand injection process carried out in the autumn. This is also an excellent opportunity to carry out an over-seeding operation to accelerate recovery.
- The height of cut on the greens should not go any lower than 3.5mm during the playing season. Maintaining a height of cut below 3.5mm for a sustained period will have a detrimental effect on the finer grasses in the greens. At this height of cut performance will still be maintained at a good level and ball roll qualities can be maintained through refinement and rolling.
- With good results seen from previous overseeding operations, a full overseeding with 100% browntop bent seed is advised to further improve the botanical composition of the greens. The technique for bent overseeding should be:
 - § Verticut or sarel roll.
 - § Broadcast seed onto surface.
 - § Top-dress to cover the seed and work into the sward
- The fertiliser programme of an early spring granular fertiliser sustained with regular liquid nutrition is performing well in delivering consistent growth and performance and should be maintained.
- The chemical analysis showed that soil pH levels are still below the ideal level at 4.7 but this is an increase on the previous year. Continue a programme aimed at gently raising this to a more suitable 5-5.5. A low soil pH will begin to lock up soil available nutrients and will also begin to reduce the natural breakdown of organic matter leading to accelerated accumulations and softer surfaces. Look to apply a calcium carbonate or dolomitic lime product to the greens in the spring. The greens should be closely monitored in the short term as disease activity may be triggered by a sudden increase in soil pH.
- The phosphate levels were identified as being a little low at 4mg/l but no direct intervention is required at this stage other than keeping a close monitor of the situation and should values fall lower and/or vigour is weak, particularly in the spring, then additional applications should be made.

Tees

- As noted in the previous report, some of the smaller tees on the course were subject to high levels of wear and divot damage, with limited space for spreading the wear recovery is being compromised. The 11th and the 15th are good examples of this, both holes generally require a shot with an iron from the tee. The size of the surfaces are such that even with good rotation of tee marker positions and proficient divotting, areas are being re-used before recovery has occurred. This has resulted in poor grass cover to the surfaces. Both tees should be extended to the right, increasing the number of potential marker positions thereby allowing more time for recovery and restoration of grass cover.

Pathways

- The pathways and high traffic routes around the course are starting to show signs of wear damage earlier in the season than normal. This is attributed to the abnormally wet conditions of the summer combined with high traffic, this gives rise to soil compaction and eventually a loss of grass cover. It is vital that protection methods be implemented as early as possible to limit the amount of damage occurring to the surfaces.

- Throughout the season or any dry periods in the coming months, compaction should be alleviated with regular verti-drain operations to help improve the drainage characteristics of the soil.

Tree Removal

- Areas to concentrate future work should have the greatest impact on the agronomic conditions of the playing surfaces (e.g. left-hand side of Green 2). The removal of a few of the species left of the 2nd green will create a channel to facilitate early morning winter sunlight without major tree removal.

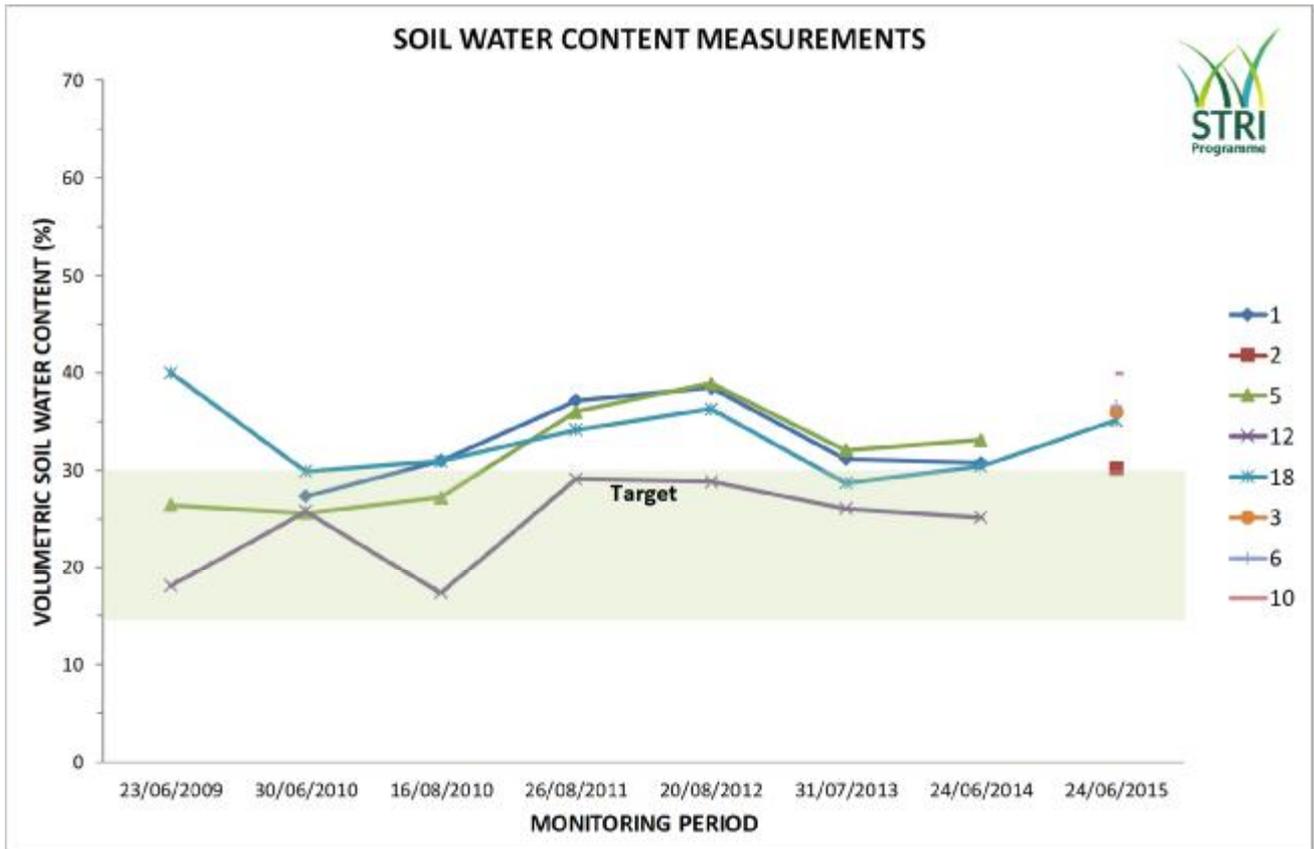
Signed

A handwritten signature in black ink, appearing to read "R. Wing", with a long horizontal flourish extending to the right.

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STRI is completely independent and has no alliances to commercial products, services or contractors. This ensures that our design, project management and advisory services provide the best solutions for each individual client.

Objective Data

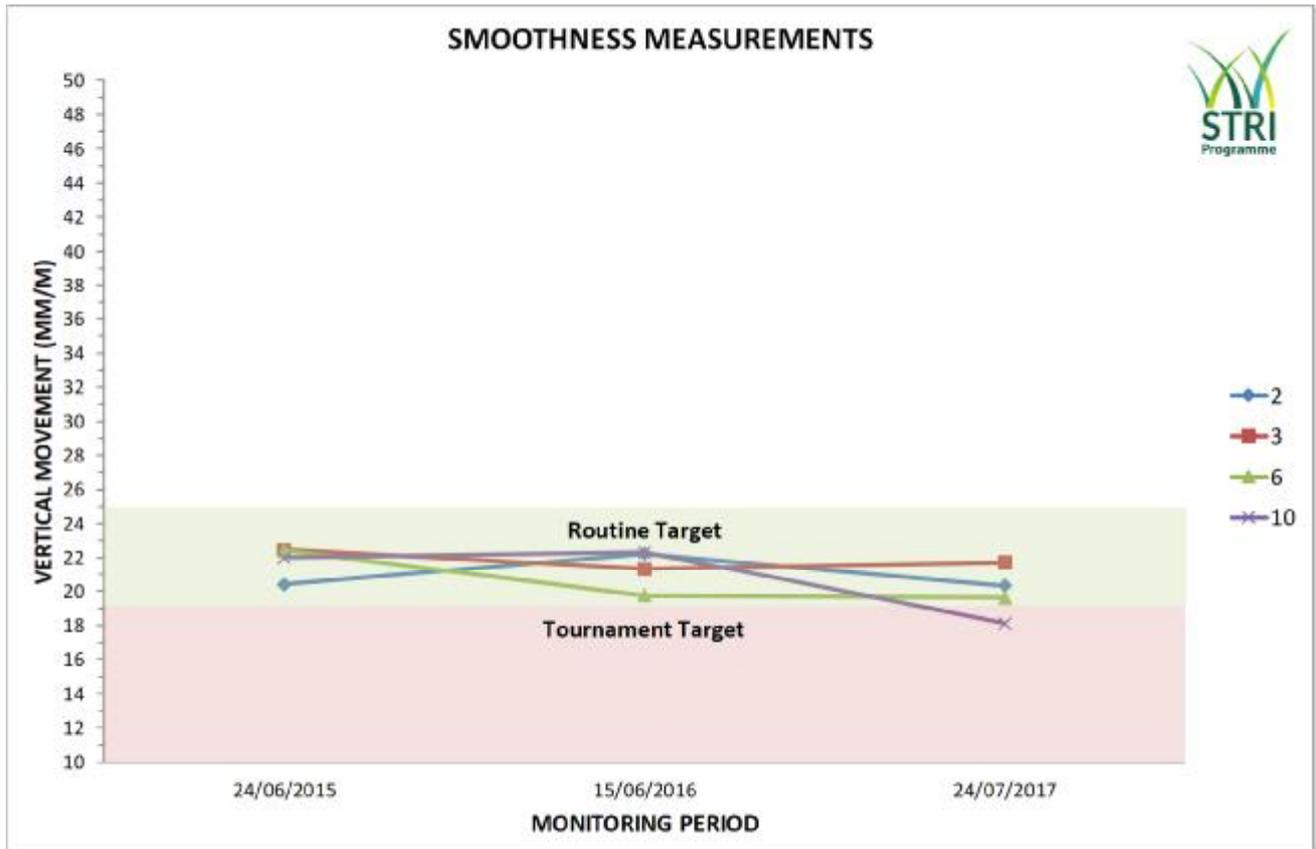


Objective Data Graph 1: Moisture levels at an average of 37.9% were higher than the ideal target range but these can be attributed to the wet conditions prior to the visit. The important result to note is the improvement of the 10th Green after the installation of the new pipe drainage.

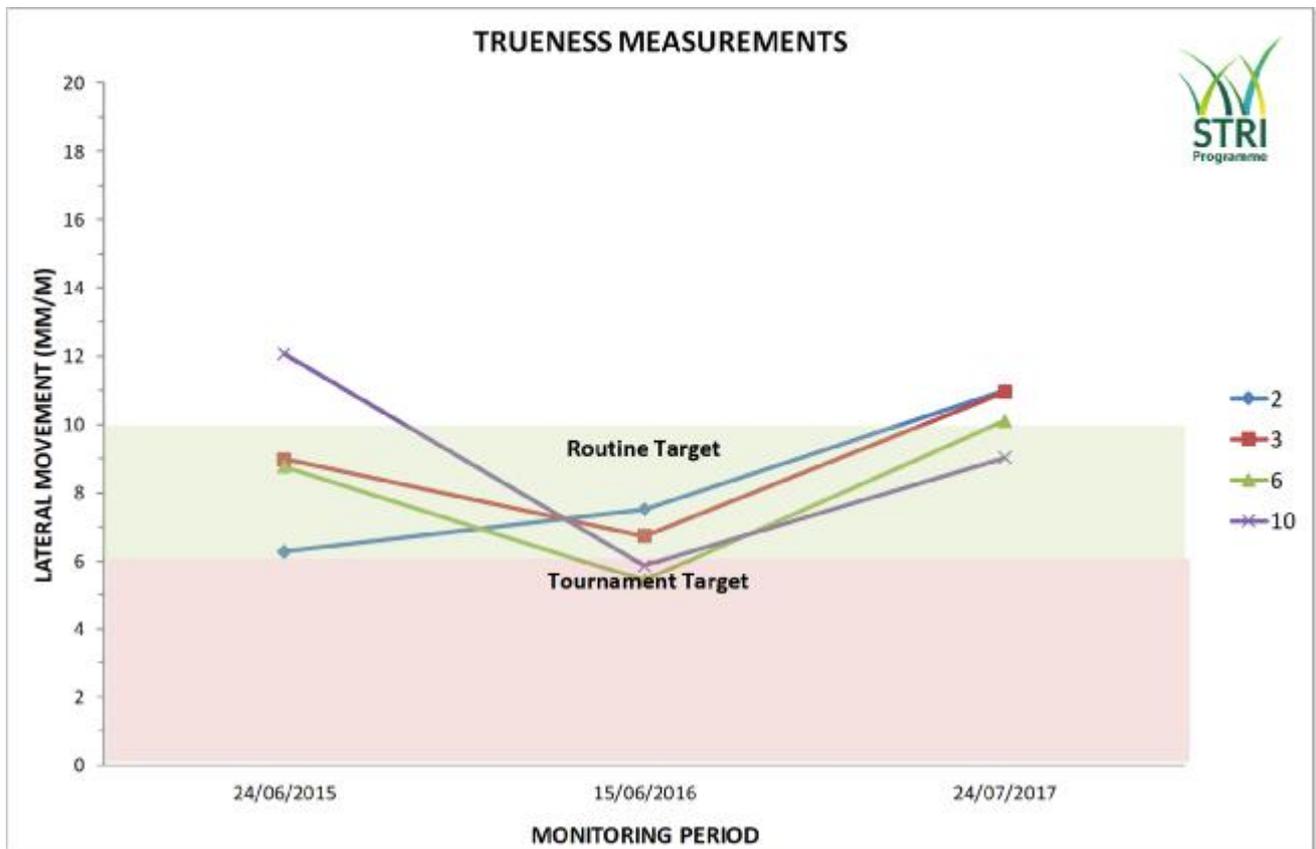


Objective Data Graph 2: Firmness results were excellent at an average of 100 Gravities with a good level of consistency following the rainfall prior to the visit. Good improvements were again seen on greens 3 & 10 after the installation of pipe drainage.

Objective Data (continued)



Objective Data Graph 3: The smoothness readings at an average of 19.9 mm/m were all under the routine target threshold.



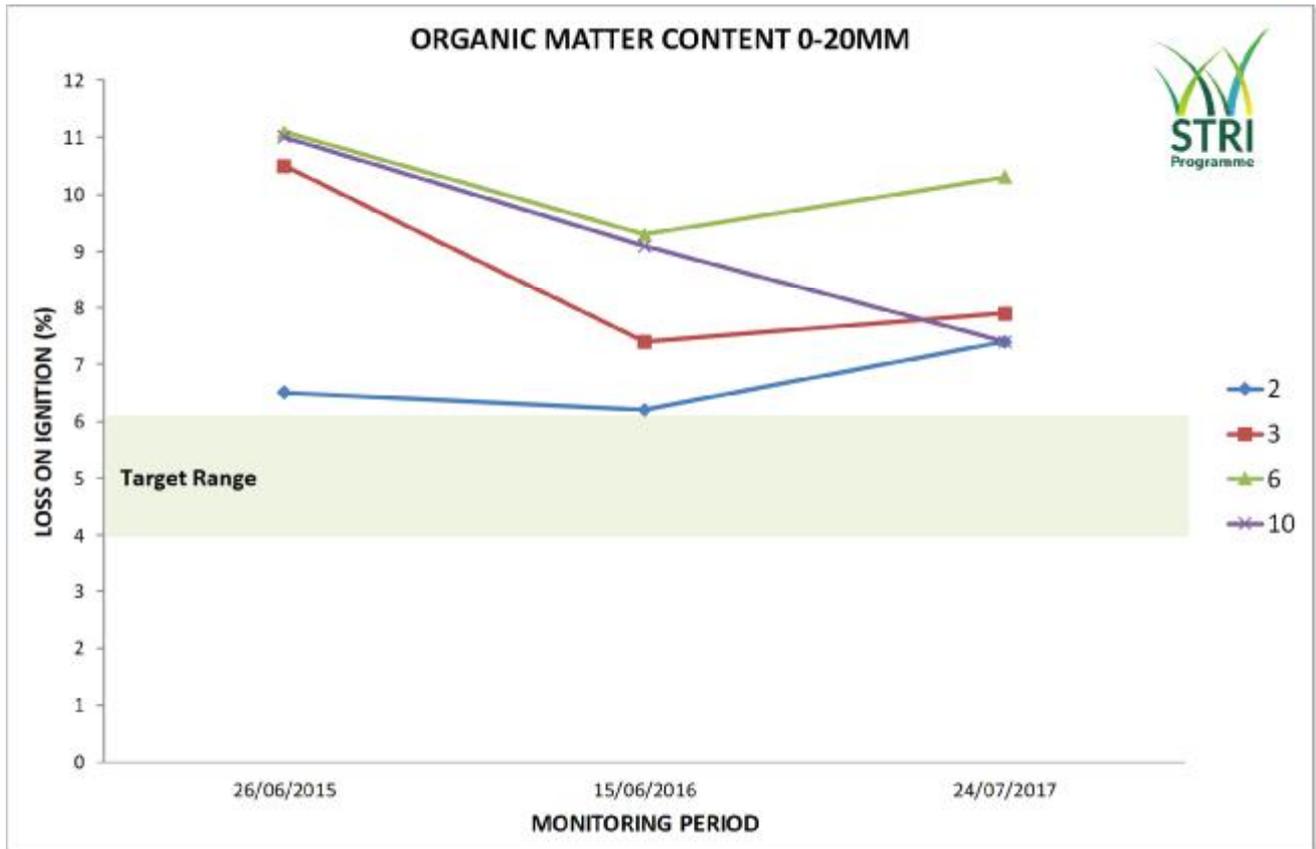
Objective Data Graph 4: At an average of 10.3mm/m trueness results were very slightly outside the routine target.

Objective Data (continued)

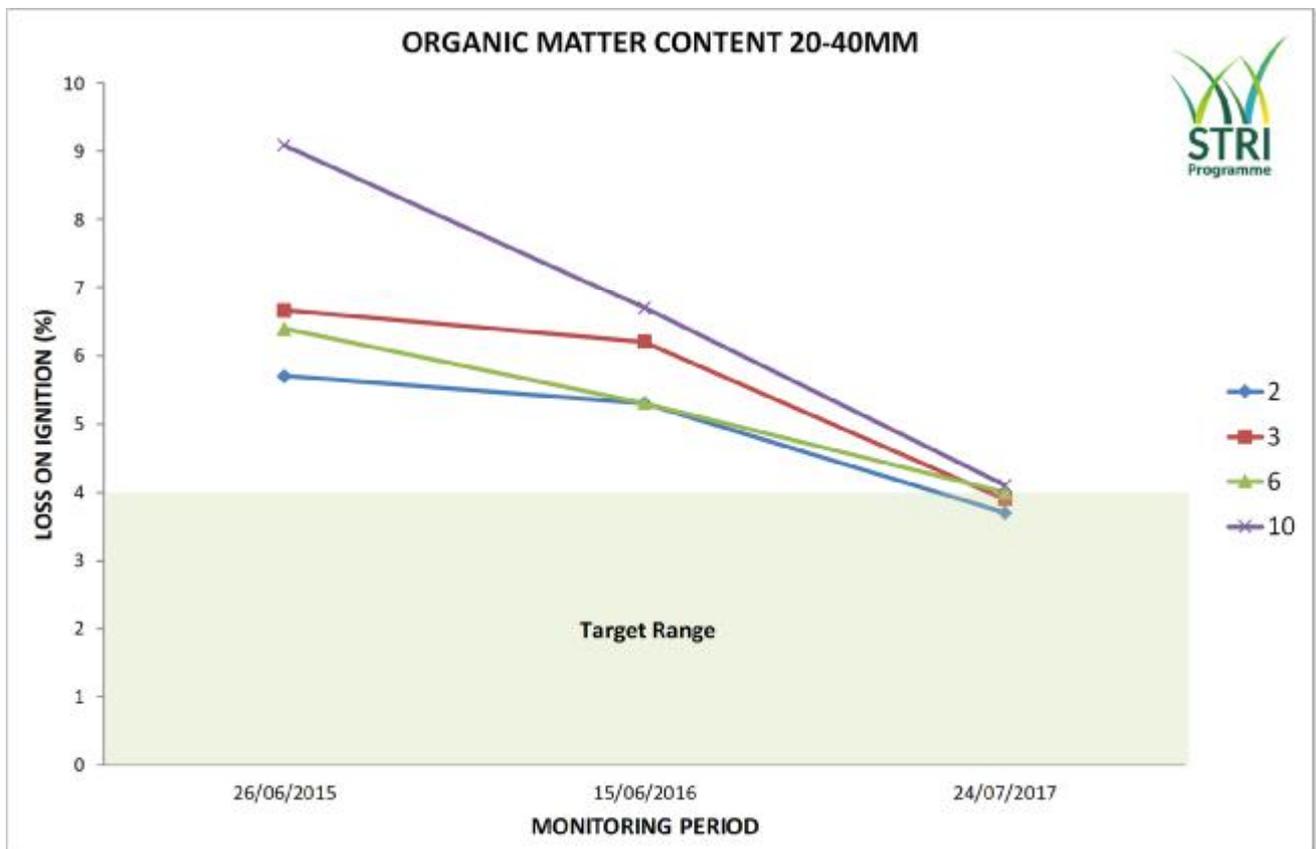


Objective Data Graph 5: Green speeds were consistent on all greens apart from 10 which was affected by the drain lines. The remainder of the greens were slightly higher than tournament target highlighting that the height of cut could be raised slightly without major negative effect and reducing the stress on the turf.

Soils Laboratory Data



Soils Laboratory Graph 1: At an average of 8.5% organic matter content at 0-20mm is higher than ideal highlighting the need to increase annual sand topdressing inputs.



Soils Laboratory Graph 2: Below the top 20mm of the profile the organic matter level is at an average of 4.0% and just on the limit of the target range. This shows the only remedial work needed is in the top 20mm.



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ORGANIC MATTER CONTENT



CLIENT: HAGGS CASTLE GC
 ADDRESS: 70 DUMBRECK ROAD,
 DUMBRECK,
 GLASGOW, G41 4SN

DATE RECEIVED: ~~22/06/17~~

DATE REPORTED: ~~03/07/17~~

RESULTS TO: RAW

TEST RESULTS AUTHORISED BY:
 Michael Baines, Laboratory Manager

CONDITION OF SAMPLE UPON ARRIVAL: MOIST

SAMPLE NO	DESCRIPTION	LOSS ON IGNITION (%) [*]
A16019/1	2 0-20 mm	7.41
	20-40 mm	3.66
	40-60 mm	2.57
	60-80 mm	2.66
A16019/2	3 0-20 mm	7.94
	20-40 mm	3.92
	40-60 mm	2.49
	60-80 mm	2.97
A16019/3	6 0-20 mm	10.34
	20-40 mm	4.04
	40-60 mm	2.48
	60-80 mm	2.66
A16019/4	10 0-20 mm	7.35
	20-40 mm	4.07
	40-60 mm	3.03
	60-80 mm	3.32

* ASTM F1647-11 Standard Test Methods for Organic Matter Content of Athletic Field Rootzone Mixes (Method A)



Testing Certificate 2159 - 01

THE RESULTS PERTAIN ONLY TO THE SAMPLE(S) SUBMITTED AND TESTED



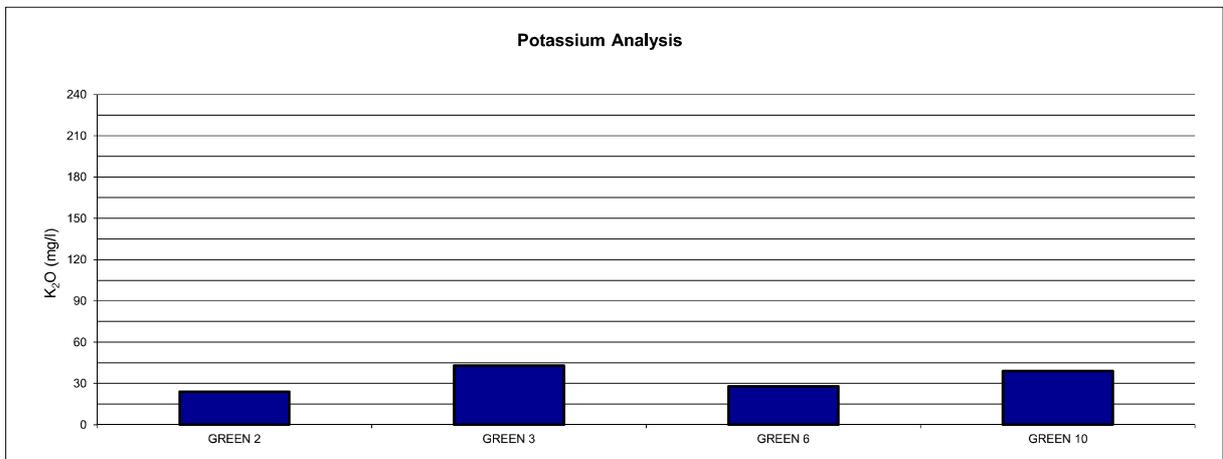
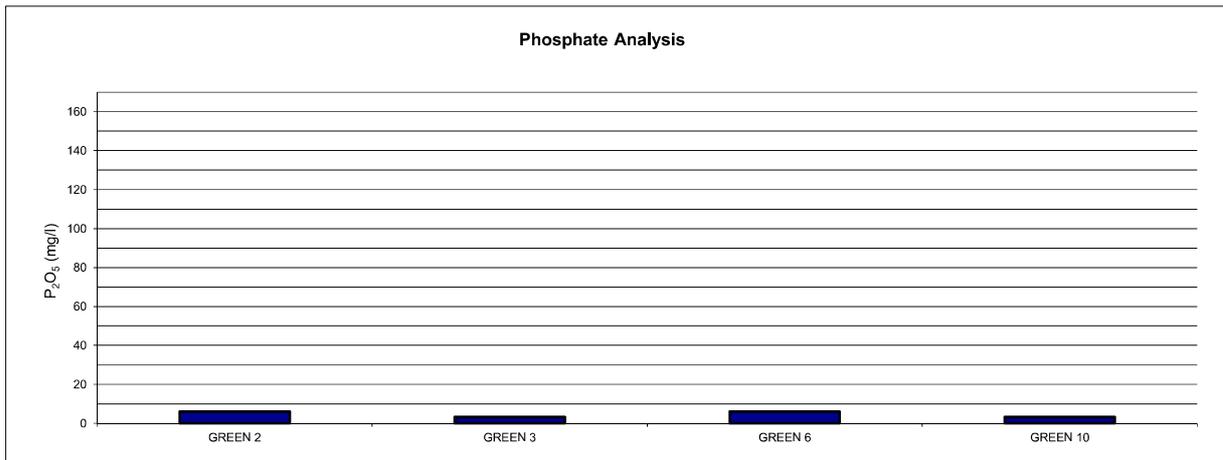
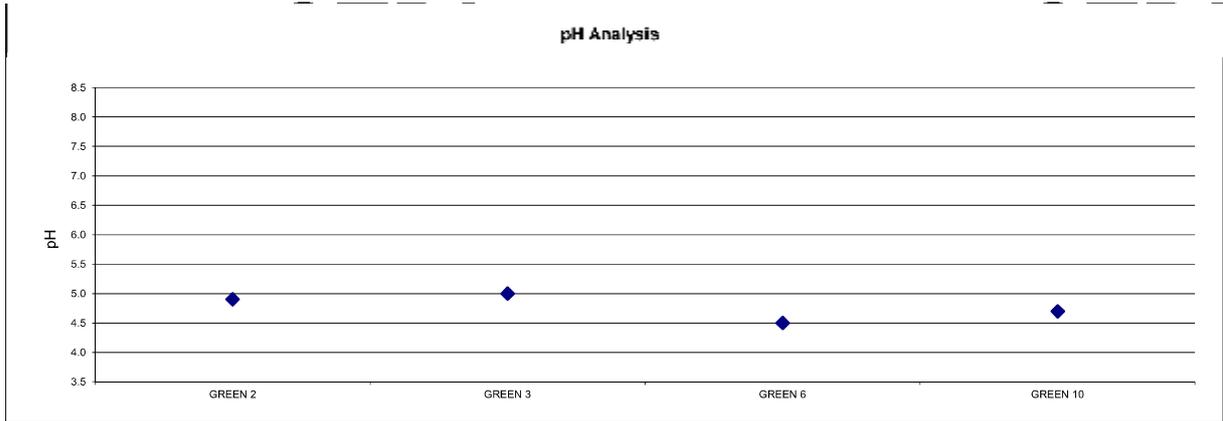
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SOIL CHEMICAL ANALYSIS

HAGGS CASTLE GC

Date: 22/06/17



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