



Making great sport happen



KILMACOLM GOLF CLUB

Advisory Report on the Golf Course incorporating the STRI Programme

Report Date: 28th September 2017
Consultant: Richard Wing



Kilmacolm Golf Club

Date of Visit: 17th August 2017

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

Present: Mr Craig Ross – Deputy Head Greenkeeper
Mr Richard Wing – STRI Ltd

Weather: Overcast w/ sunny intervals, 15°C (heavy rain prior to visit).

Headlines

- The presentation of the course was good despite a wet summer prior to the visit.
- Organic matter has reduced in the top 20mm of the soil profiles but remains excessive at 20-60mm.
- Despite the high moisture content of the greens, the firmness average was still just in target range.
- Reductions in organic matter now provide an opportunity to improve sward composition.
- Evidence of scarring from dry patch onset was visible on certain greens causing thinning of the turf.
- The bunkers were well maintained around the course but their performance was inconsistent.

Key Actions

- Implement mechanical organic matter reduction through hollow coring to 60mm depth.
- Maintain sand top dressing inputs to a minimum of 120 tonnes/ha.
- Introduce over-seeding with 100% browntop bent to further improve sward composition.
- Reduce the chances of dry patch onset by implementing a preventative wetting agent programme.
- Continue to upgrade bunker constructions using a suitable bunker liner.
- All interested parties should attend the STRI Programme visit to facilitate better discussions of maintenance plans.

Objective Measurements

Measurement	Average	Target Range
Soil Moisture (%)	46.1% (range 38-54%)	15-30%
Hardness (Gravities)	85 Gravities (range 78-91 g)	85-110 g
Smoothness (mm/m)	26.3 mm/m	<25 mm/m
Trueness (mm/m)	12.0 mm/m	<10 mm/m
Green Speed	8 ft 5 in	8-9 ft
Organic Matter 0-20 mm (%)	6.3%	4-6%
Organic Matter 20-40 mm (%)	9.0%	<4%
Soil pH	5.0	5.0-6.0
Phosphate (P ₂ O ₅)	8.3 mg/l	>10 (mg/l)
Potassium (K ₂ O)	50.2 mg/l	>30 mg/l

Key: In Target Marginal Variance Out of Target

Photo Observations and Comments



Figure 1: Despite the challenging wet conditions of the summer the course was well presented with good definition.



Figure 2: The surfaces were requiring more intensive refinement work through verti-cutting to improve the ball roll qualities but this has been compromised by the wet conditions of the greens.



Figure 3: The sward composition displayed a good blend of annual meadowgrass with populations of bent grass but increasing bent populations will improve year-round performance further



Figure 4: The soil profiles displayed a good consistent amelioration of sand but organic matter accumulations in the top 60mm were excessive causing moisture retention in the profile.



Figure 5: The soils at depth were tight and compact compromising the drainage properties of the profiles. Deep aeration to relieve this 'tightness' is required.



Figure 6: The green surfaces that are under more pressure display a weaker annual meadow grass dominant composition. The previous onset of dry patch during the dry spell in the spring has left an open sward leaving space for the ingress of moss.

Photo Observations and Comments (continued)



Figure 7: The fairways displayed a good composition of fine grasses and gave support to the ball with pleasing levels of firmness under foot despite the wet conditions.



Figure 8: The bunkers throughout the course were well presented but the sand quality and depth was inconsistent.



Figure 9: Whilst some of the roughs display finer grass species they are still dense in texture. Continued management through cutting & collecting will be required to further refine the sward texture.

Recommendations

Greens

- The work over previous years of increasing top dressing has seen a good reduction of organic matter in the top 20mm of the profile. However organic matter at 20-60mm of the soil profiles is still excessive. To reduce organic matter at the depths required a hollow coring operation to 60mm depth with 12mm tines should be carried out. This should be followed by a heavier sand top-dressing worked down the holes to maintain the surface levels. The use of a sweep 'n' fill brush would help further with working sand into the profile.
- Annual sand top-dressing should be maintained at a minimum of 120 tonnes/ha, applied through regular light dustings combined with a heavier dressing at the time of renovation work. To help work the top-dressing into the profile, applications should be combined with regular solid tining with a 6-8mm tine.
- Obtaining a consistent blend of browntop bent throughout the greens will provide more consistent performance throughout the calendar year. Over-seed the greens using 100% browntop bent seed mixture at 6-8g per m² ideally in the height of the growing season (July-August). The technique for bent over seeding should be:
 - § Verti-cut or sarel roll.
 - § Broadcast seed onto surface.
 - § Top-dress to cover the seed and work into the sward.
- Keeping the cutting height at a minimum of 4mm will help to favour the browntop bent component of the sward over the annual meadowgrass. Lower cutting height exert excessive stress on the surface, thereby favouring the annual meadowgrass.
- Winter aeration should combine a minimum of three Air2G2 operations to provide the deep aeration the soil profiles require. The process of fracturing and fissuring the soil through air injection at 7 or 11 inches depth will improve the movement of moisture through the profile. This should be combined with a minimum of one verti-drain operation using 12mm tines with little to no heave to join up the aeration work. The use of an Air2G2 can also be extended into moisture retentive areas of the surrounds.
- Through the winter, applications of ammonium sulphate (10kg/ha) combined with iron sulphate (10kg/ha) as and when needed, will give nutritional support to the greens and help treat the ingress of moss in the surfaces.
- To help remedy sward thinning, actions to avoid the onset of dry patch during dry spells should be taken. The utilisation of a wetting agent programme is advised for the greens through monthly applications of a surfactant (e.g. Aquatrols Revolution) from March to August to aid with moisture management in the soil profiles.
- The phosphate levels were identified to be a little low at 8mg/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 turf vigour is weak, particularly in the spring, then additional applications should be made

Green Collars, Surrounds and Approaches

- Extend maintenance practices of the greens (e.g. top-dressing & aeration) out onto the surrounds and approaches to further improve the consistency of the surfaces.
- Ideally the hollow coring operation will extend out over these areas combined with a heavy sand top-dressing. This will improve the surface drainage qualities and improve the firmness in consistency with the greens.

Bunkers

- To provide some form of consistent performance, the bunkers require considerable amount of maintenance time. However, due to the differences in construction, any maintenance work will be inefficient with the differences in sand quality and depths.
- The only way to improve the bunkers consistency is continuing the large-scale programme of renovation involving the following process:
 - Install a modern bunker liner material, e.g. Capillary Concrete, Bunker Blinder etc to ensure the bunker sand is separate from the indigenous soil thereby; maintaining clean and consistent bunker sand.
 - Implement the plan over as short time as possible to minimise disruption to golf.

Rough Grassland

- Most of the managed rough grasslands around the course display a good grass composition but certain areas require ongoing maintenance to further refine the density of the sward. In addition to the cut & collect operation the use of a rake to thin out the density of the sward would be beneficial to the playability.

Signed

A handwritten signature in black ink, appearing to read 'R. Wing', with a horizontal line underneath.

Richard Wing BSc (Hons)
Regional Turfgrass Agronomist

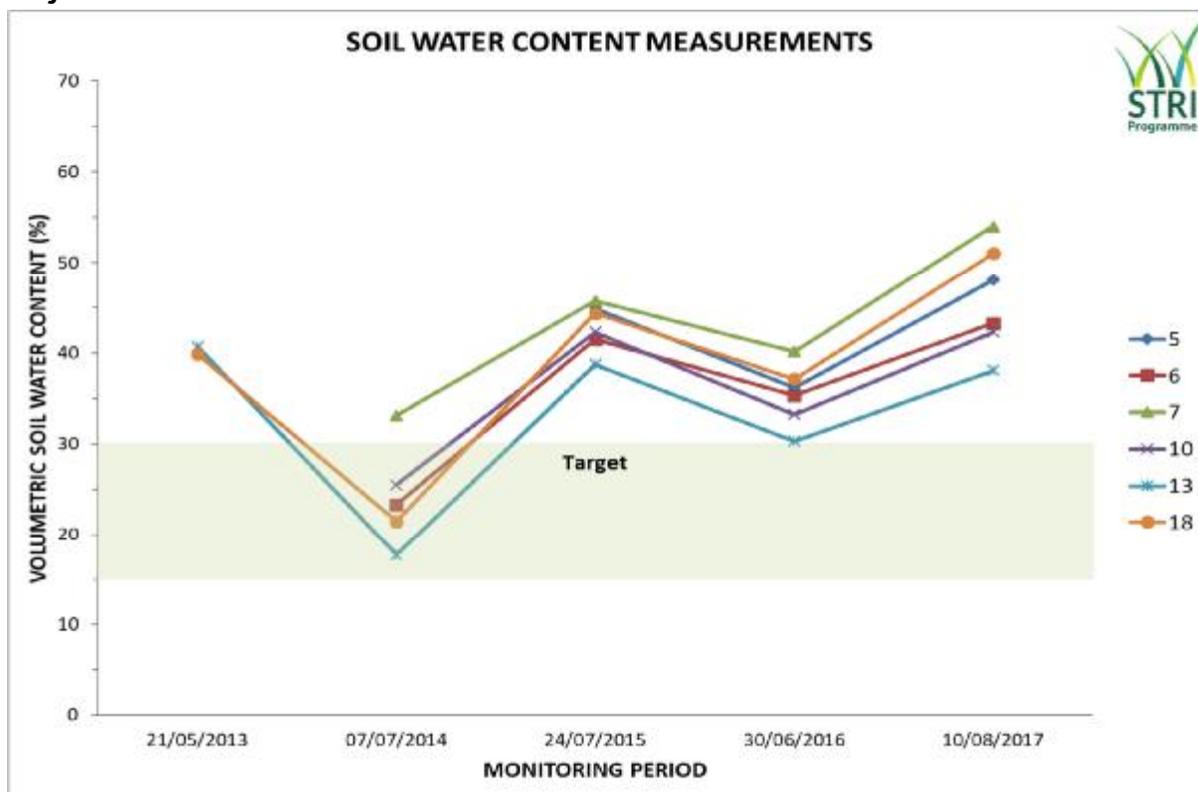
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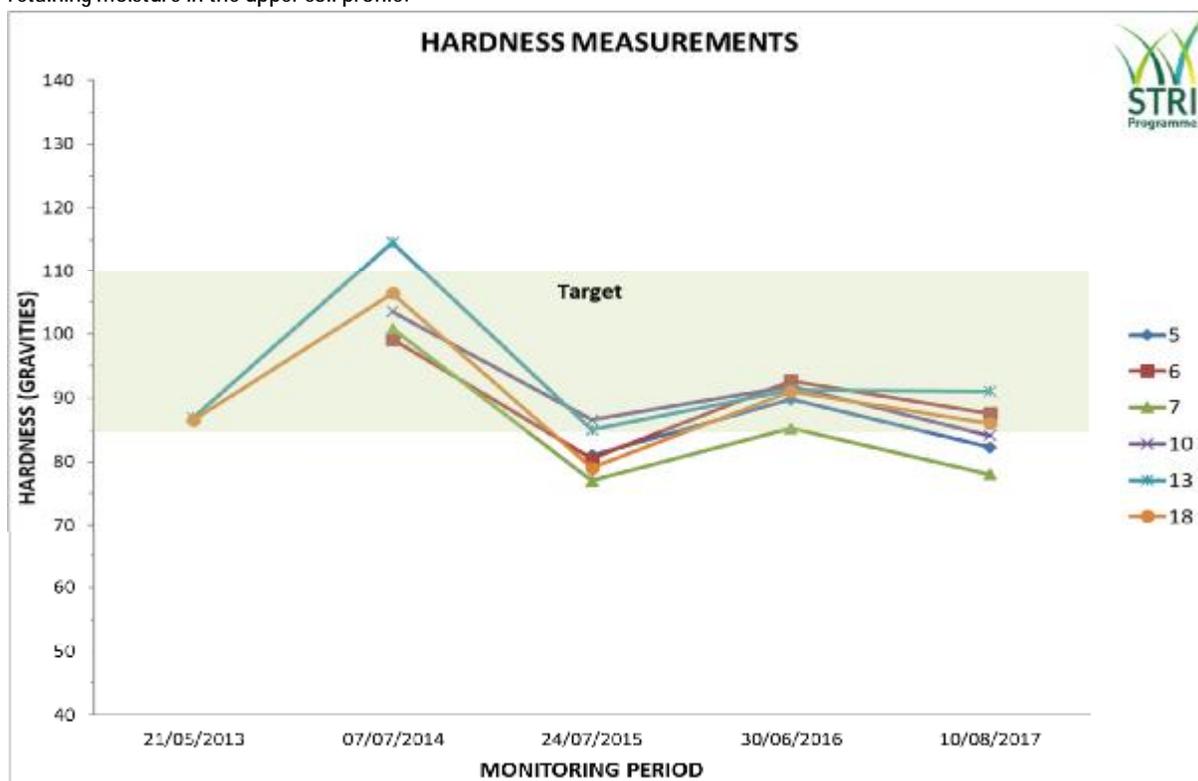
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Objective Data

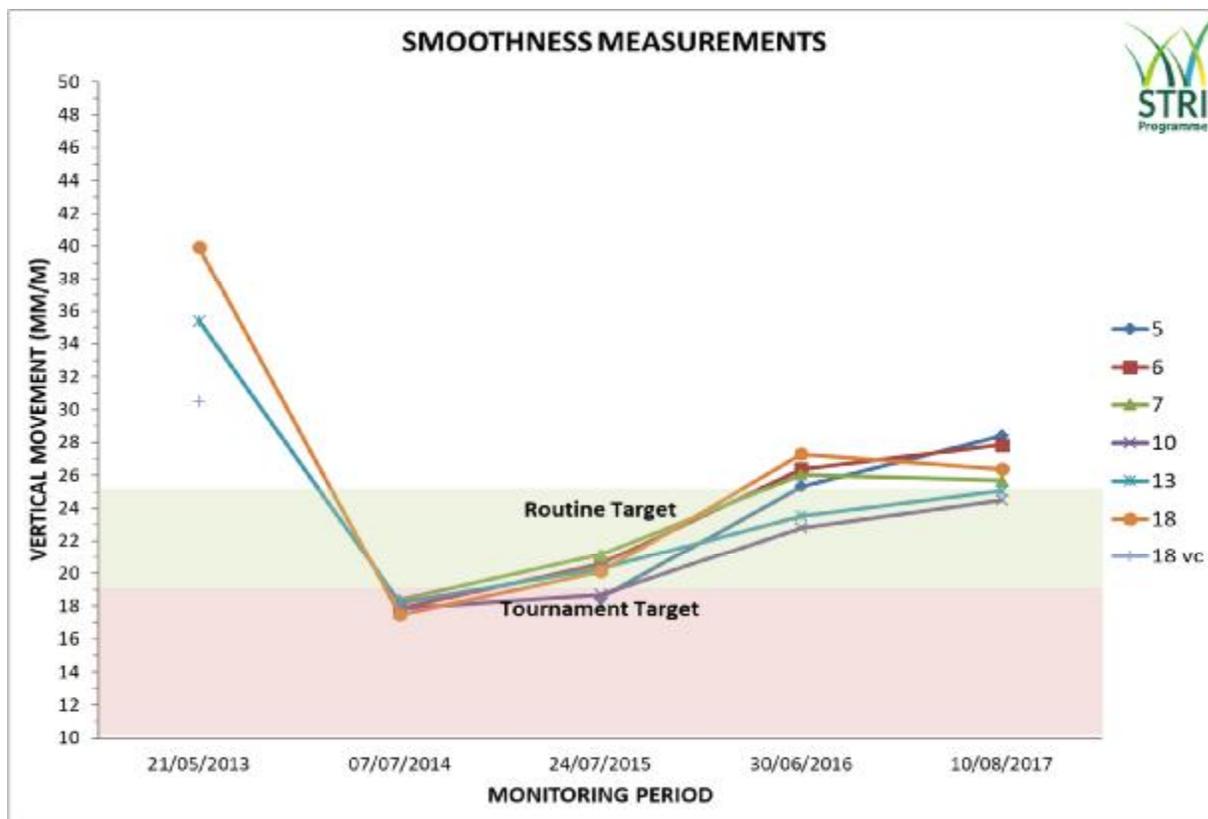


Objective Data Graph 1: At an average 46.1%, the moisture content of the greens was much higher than ideal. This can be partly attributed to the wet weather of the summer and prior to the visit and partly due to the excessive organic matter content retaining moisture in the upper soil profile.

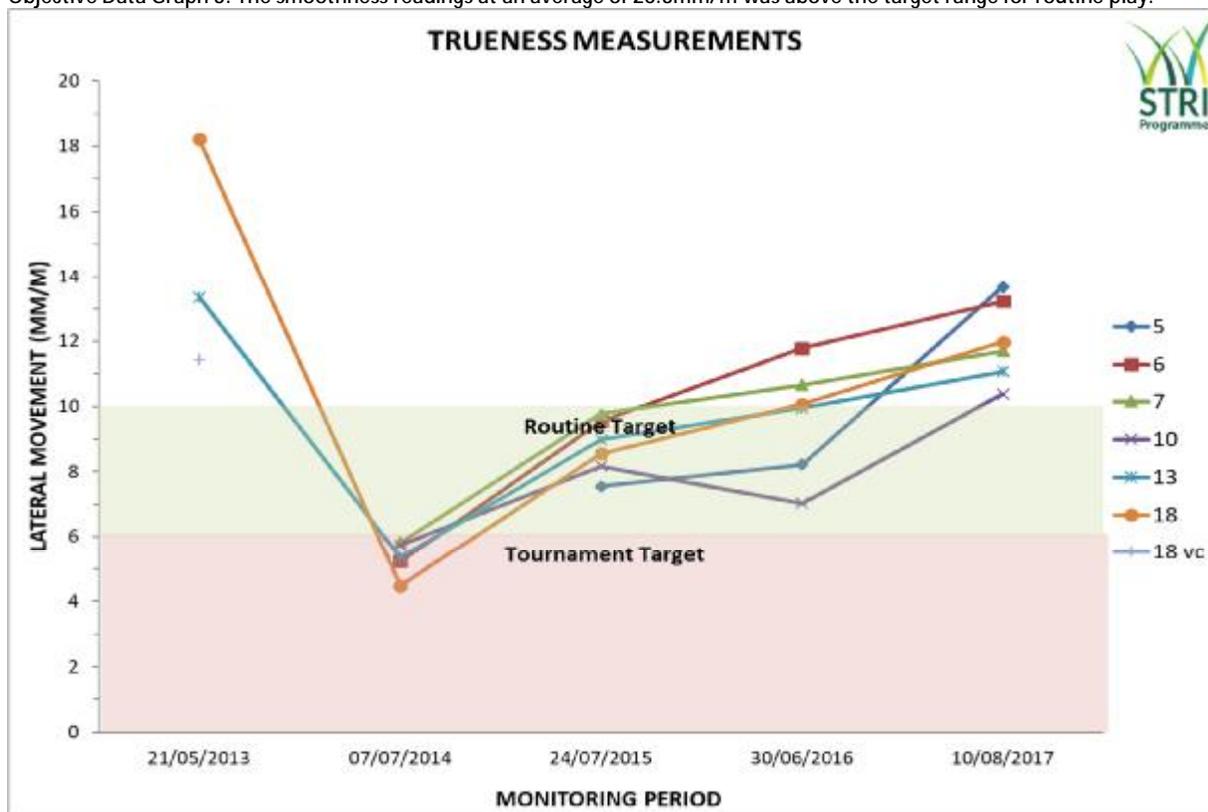


Objective Data Graph 2: Despite the increase in moisture, the firmness of the greens has only slightly decreased to an average of 85 Gravities due to the decrease in organic matter at 0-20mm of the profile.

Objective Data (continued)

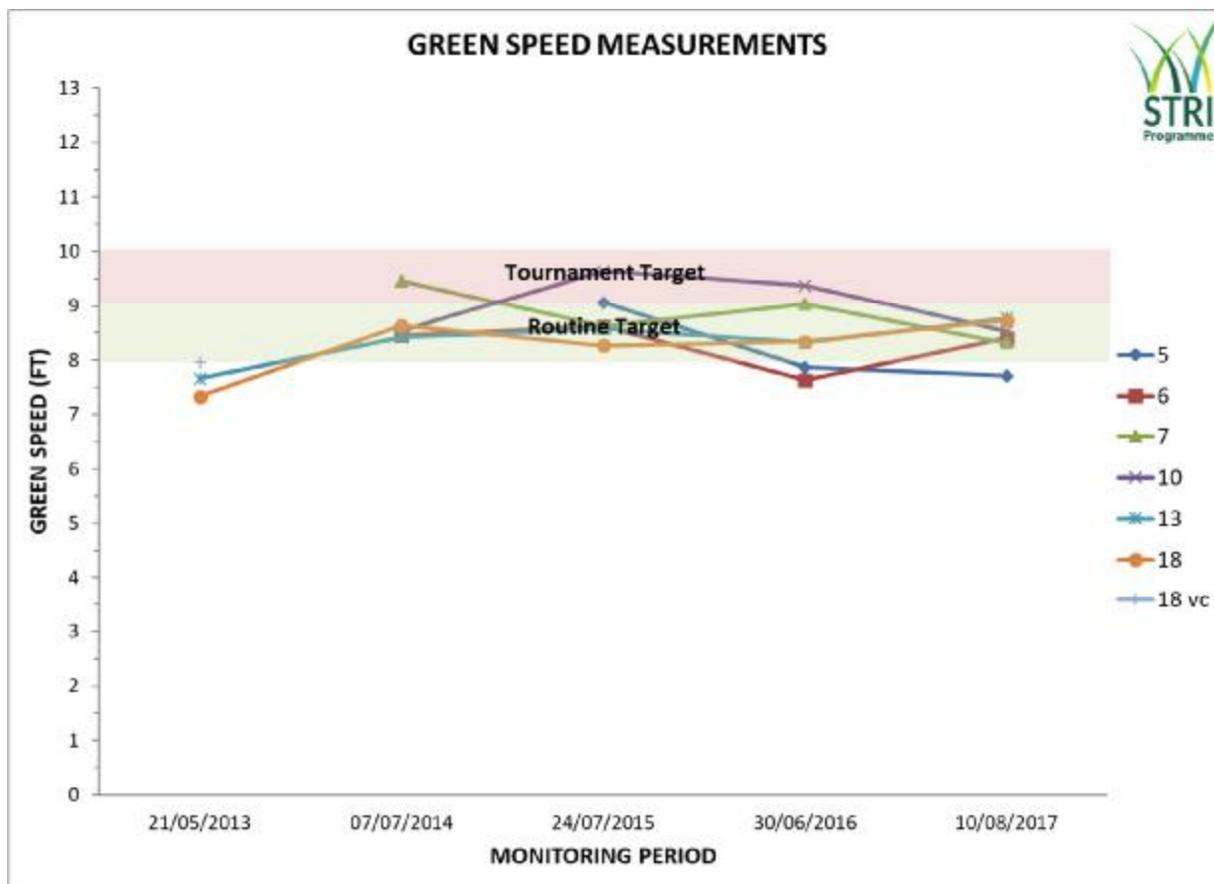


Objective Data Graph 3: The smoothness readings at an average of 26.3mm/m was above the target range for routine play.



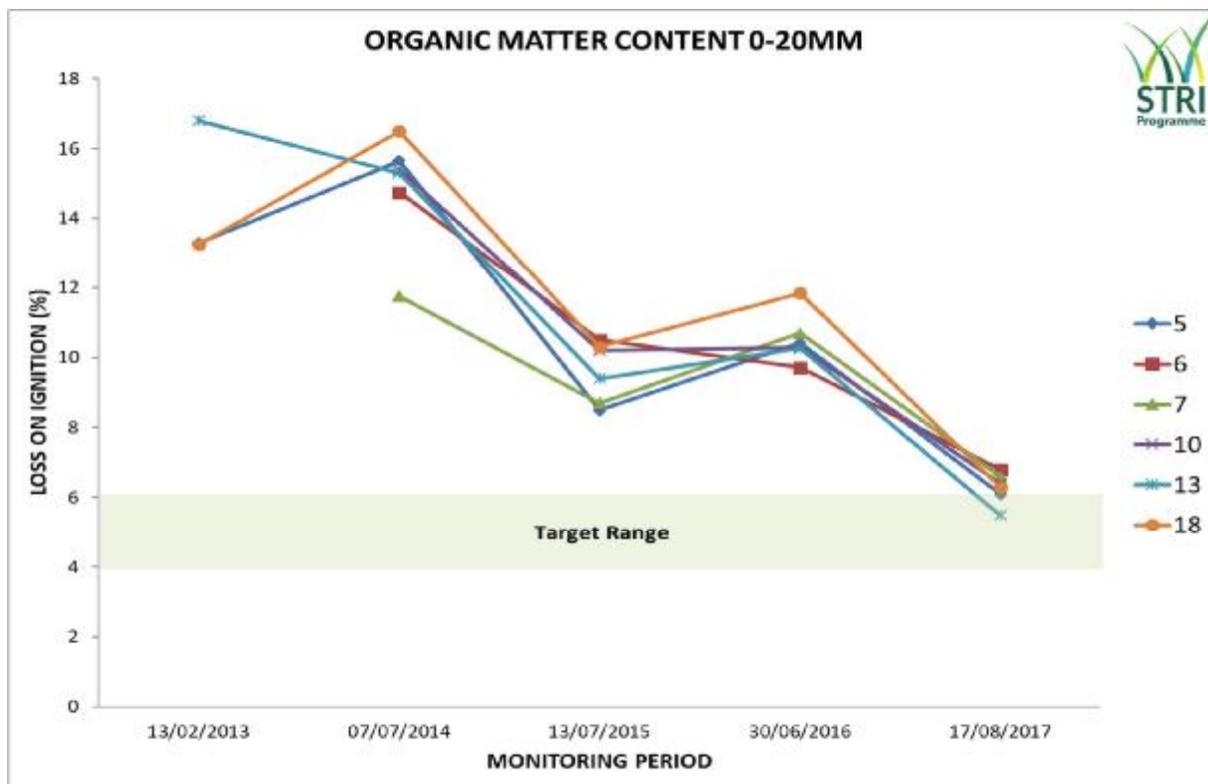
Objective Data Graph 4: The trueness readings at an average of 12.0mm/m was above the target range for routine play.

Objective Data (continued)

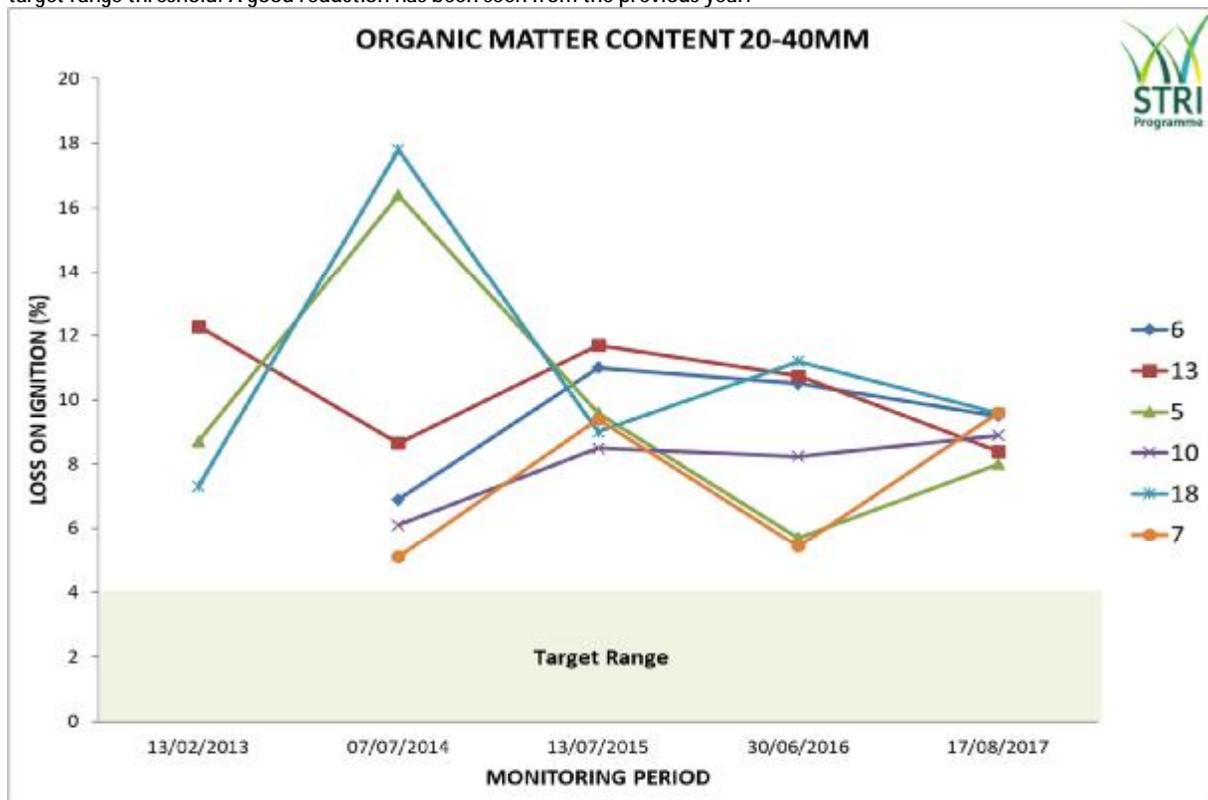


Objective Data Graph 5: The average of the green speed was 8ft 5in with good consistency apart from the 5th green that was slightly slower than the rest.

Soils Laboratory Data



Soils Laboratory Graph 1: At an average of 6.3% organic matter content in the top 20mm of the soil profile is only slightly above the target range threshold. A good reduction has been seen from the previous year.



Soils Laboratory Graph 2: At 20-40mm the organic matter content remains higher than ideal at an average of 9.0% highlighting the need to still remove organic matter at this depth.

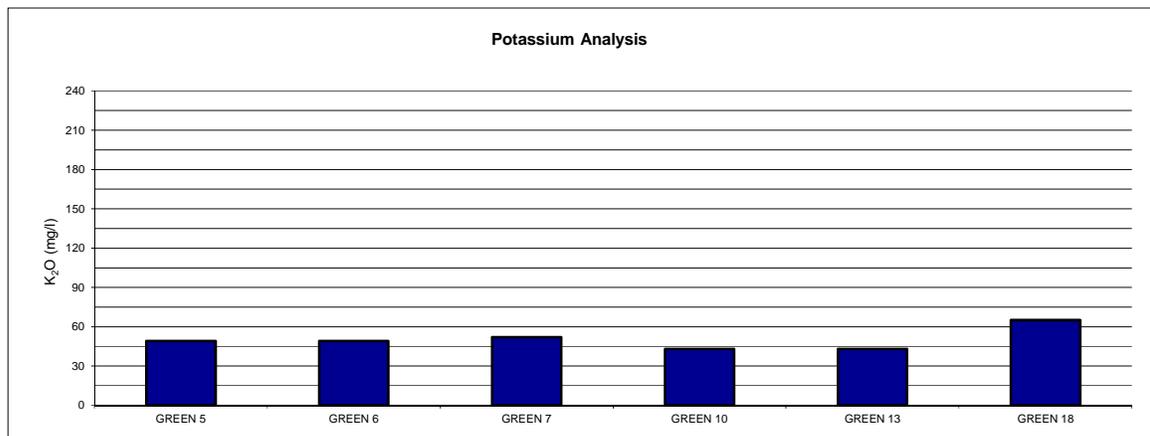
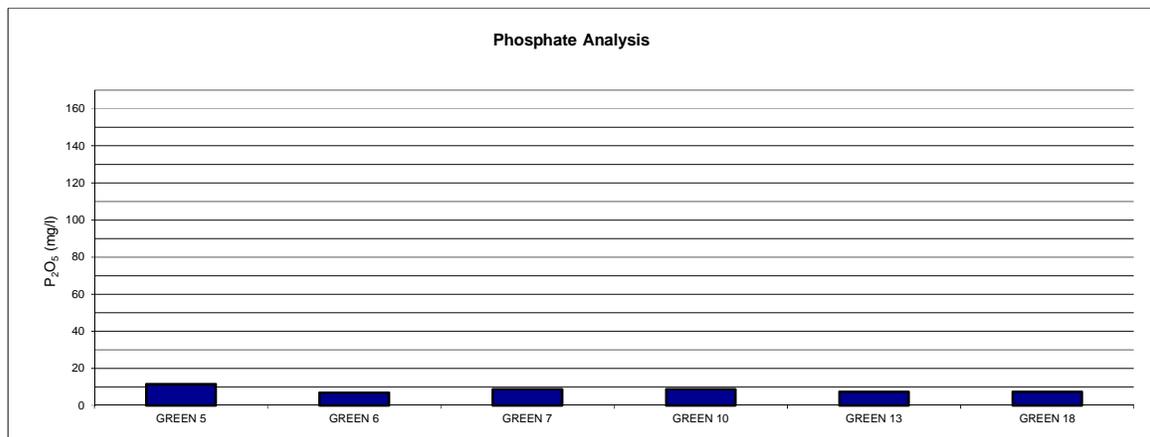
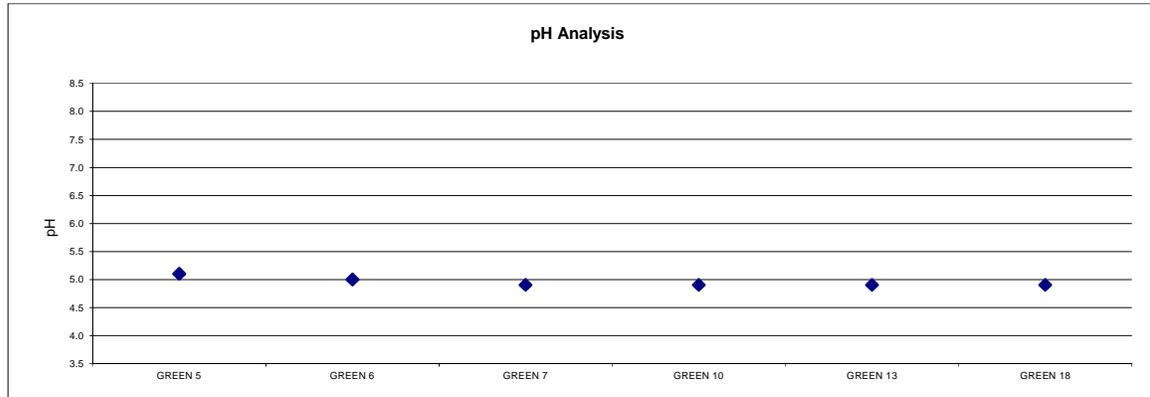
STRI

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SOIL CHEMICAL ANALYSIS

KILMACOLM GC

Date: 26/07/17



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

ORGANIC MATTER CONTENT

CLIENT: KILMACOLM GC
ADDRESS: PORTERFIELD ROAD,
KILMACOLM,
RENFREWSHIRE, PA13 4PD

DATE RECEIVED: 26/07/17
DATE REPORTED: 28/07/17
RESULTS TO: RAW

TEST RESULTS AUTHORISED BY:

Michael Baines, Laboratory Manager

CONDITION OF SAMPLE UPON ARRIVAL: MOIST

SAMPLE NO	DESCRIPTION	LOSS ON IGNITION (%) [*]
A16122/1	5 0-20 mm	6.05
	20-40 mm	8.02
	40-60 mm	4.53
	60-80 mm	4.11
A16122/2	6 0-20 mm	6.77
	20-40 mm	9.53
	40-60 mm	5.72
	60-80 mm	4.09
A16122/3	7 0-20 mm	6.57
	20-40 mm	9.62
	40-60 mm	4.47
	60-80 mm	4.08
A16122/4	10 0-20 mm	6.37
	20-40 mm	8.94
	40-60 mm	4.59
	60-80 mm	3.68
A16122/5	13 0-20 mm	5.47
	20-40 mm	8.39
	40-60 mm	5.76
	60-80 mm	4.89
A16122/6	18 0-20 mm	6.29
	20-40 mm	9.60
	40-60 mm	5.02
	60-80 mm	4.53

* 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