



ECB/IOG Performance Quality Standards
Cricket Square – Playing Season
Seamup Cricket Club
Greendale Premier League



PERFORMANCE QUALITY STANDARD REPORT FOR SEAMUP CC CRICKET CLUB

Date of visit	29 May 2016
Time of visit	13.00 hours
Weather Conditions	Dry and overcast
Ground Conditions	Dry
Pitch Advisor	F Jones
Others Present	P Green - Groundsman

Introduction

This report looks solely at the cricket square at Seamup CC Cricket Club and does not include the outfield or other facilities.

The main purpose of assessing the condition of the cricket square is to determine whether its characteristics meet the Performance Quality Standards (PQS) benchmarked by the ECB/Institute of Groundsmanship.

These characteristics provide evidence on the quality of past maintenance regimes and act as a guide for future regimes.

The standard for the square was assessed as: **Club**

The PQS Assessment is calculated as: **Basic**

History

The club has been playing on the current ground since 1935. The square was resurfaced in 2006 as part of the ECB CCDF scheme.

The club has 4 senior teams and a very active junior section with over 100 junior members. The square has 10 playing strips and suffers from low bounce and lack of pace.

Methodology

The square was quantified and a report compiled using the following methods:-

- 1) Determination of the quality using Performance Quality Standards
- 2) Visual assessment of extracted cores.
- 3) Laboratory testing of soil profile

ECB/IOG PQS Table – Cricket Square Playing Season

Seamup CC				Unit	Mark	PQS Grade
1	Length of grass sward			mm	12	Premier
2	Total ground cover			%	85	Club
3	Desirable grasses			%	75	Basic
4	Undesirable grasses			%	25	Basic
5	Weeds			%	5	Basic
6	Pests & Diseases			%	3	Basic
7	Root depth			mm	100	Premier
8	Thatch			mm	3	Basic
9	Rootzone profile			mm	60	Unsuitable
10	Evenness/3 M straightedge			mm	3	Basic
11	Gradient-direction of play/3 M	1:	86	mm	35	Premier
12	Gradient-across play/3 M	1:	120	mm	25	Basic
13	Soil qualities - Clay content			%	27	Club
14	Soil qualities - Binding strength			Kg		Not assessed
15	Soil qualities - Organic matter			%	3.2	Premier
16	Soil qualities - pH			No.	7	Premier
17	Soil qualities - Phosphate			Index No	2	Premier
18	Soil qualities - Potash			Index No	2	Premier
19	Soil qualities - Magnesium			Index No	3	Club
20	Appearance and presentation			%	85	Club
21	Surface Debris			%	0	Premier
22	Post match repairs			%	75	Basic
23	Pitch Markings			%	75	Basic
Pitch Standard Assessed:				Club		
Performance Quality Standard:				Basic		
Pitch Advisor:				F Jones		
Date of Assessment:				29/05/2016		

Observations on assessment findings – Playing season

<p>1.Cutting Height: <i>Mown height measured in mm of the grass currently maintained during the non-playing season in relation to the standard of pitch being assessed.</i></p>	<p>The height of sward was measured across the square including prepared pitches and those that had been used. The average height of cut was 12mm.</p>
<p>2.Ground Cover: <i>The % current ground cover and the % current bare area in relation to the standard of the pitch being assessed.</i> <i>Includes all vegetation including grasses, weeds, moss, and algae</i></p>	<p>Overall ground coverage on the square was assessed as 85%. Some of the pitches that will be used later on exhibited weak areas of growth in the crease areas.</p>
<p>3.Desirable Grasses: <i>The % desirable grass species present on the square in relation to the standard assessed?</i> <i>Desirable grasses for cricket squares will normally be fine leaved Perennial ryegrass (Lolium perenne) as the main and sometimes only specie specified as being hard wearing, quick to establish, and tolerant of close mowing.</i></p>	<p>The desirable grass species suitable for cricket within the sward were Dwarf Perennial Rye grass (<i>Lolium perenne</i>) at 75%,</p>
<p>4.Un- Desirable Grasses: <i>The % undesirable (weed) grass species such as Poa annua or weed grasses in relation to the standard assessed?</i> <i>Annual Meadow Grass (Poa annua) has poor root growth in consolidated soil. Root growth is one of the two things which hold a wicket together, (the other being the clay in the cricket loam). Poa annua also has poor wear tolerance, encourages thatch, poor colour in low nutrient level soils and is a host for a number of turf diseases.</i> <i>Hence Poa annua is considered to be a weed grass on cricket squares and should be kept to a minimum</i> <i>Other coarse leaved pasture grasses should</i></p>	<p>The undesirable grass species observed in the sward were Annual Meadow grass (<i>Poa annua</i>) at 20% and Creeping Bent (<i>Agrostis stolonifera</i> at 5%). Annual Meadow grass is considered a weed in sports turf and is unsuitable for cricket surfaces due to its shallow rooting which affords greatly reduced binding capacity, Poor colour and readily produces thatch due to the fact that its an annual and completes its life cycle within a year, prone to harbour pest and disease as a result of its growth habit. Creeping Bent produces stolons which if not controlled via verti cutting will increase organic matter content of the sward</p>
<p>5.Weeds: <i>The % weed infestation? Including moss, algae, and lichen in relation to the standard assessed</i> <i>Pitches should be kept weed free as they can affect the true bounce of the ball in particular if they are present 'on a length. 'the presence of slime moulds can create slippery areas.'</i></p>	<p>A 5% weed population was observed across the assessed area, these include Common Clover (<i>Trifolium repens</i>), Creeping Buttercup (<i>Ranunculus repens</i>), Daisy (<i>Bellis perennis</i>)</p>
<p>6.Pests and Diseases: <i>The % of pests and disease including worms casts in relation to the standard assessed</i> <i>Likely pest and disease problems with cricket squares include fairy rings, Fusarium disease, and especially worm casts.</i></p>	<p>A 3% disease population was observed across the assessed areas</p>
<p>7.Thatch: <i>The depth of thatch in mm relation to the standard assessed</i> <i>Thatch is the accumulated fibrous organic matter from grass growth that forms a spongy layer at the surface of a pitch. Often dark in colour and made up from partly decomposed grass leaf, crowns and roots.</i> <i>Thatch accumulation on the surface and in the soil profile slows pitch pace and bounce as it acts like a shock absorber in the pitch. This energy is absorbed by the pitch and not returned to the ball. Controlling thatch in the pitch can help improve pace and bounce in a pitch.</i></p>	<p>There was a build up of a 3mm layer of thatch at the surface (refer to the photo of the sample core).</p>
<p>8.Root Depth: <i>The depth of roots in relation to the standard assessed</i> <i>This measures healthy and <u>continuous</u> root penetration at depth into the soil profile.</i></p>	<p>Average root growth was recorded as 80 mm at this depth root density was very weak. Greater rooting density existed in samples 1 & 2 where root growth was evident down in an aeration hole and in the top 50mm in other sampled areas.</p>

<p>9.Rootzone Profile: <i>The depth of rootzone fully integrated to 100 mm depth</i></p> <p><i>This measures depth of cricket loam with no breaks or discontinuities, no unwanted zones of fibre or unwanted soil (e.g. marl or unsuitable indigenous soil), and no air spaces between zones.</i></p>	<p>The depth of root zone varied from 56mm to 65mm across the sampled areas against a recommended level of 80-100mm. The club have gradually changed from Mendip loam to Ongar loam over a 3 year period.</p>
<p>10.Evenness: <i>The range of Evenness measured under a 3M straightedge in relation to the standard assessed.</i></p> <p><i>This measurement identifies depressions and hollows on the square, and saddles at the ends of the pitches</i></p>	<p>Surface evenness showed showed a maximum variation of 3mm using a 3m straightedge. Early formation of saddles (raised ends) was noted</p>
<p>11/12 Gradients: <i>The range of localised gradients across and down the line of play in relation to the standard assessed?</i></p> <p><u><i>These measurements are not normally categorised in the assessment process, as gradients on a cricket ground are normally a feature in the original construction that cannot easily be altered without major re-construction.</i></u></p>	<p>Gradients of 1:86 in the line of play and 1:150 across the line of play were recorded.</p>
<p>13/19 Soil Qualities from Sampling results: <i>Soil analyses are carried out by an approved test laboratory to provide accurate information on soil texture (% levels of clay/silt/sand), % levels of organic matter, pH (soil acidity or alkalinity), and available nutrient levels of the major elements such as Phosphate, Potash, and Magnesium.</i></p>	<p>The soil organic matter was recorded as 3.2% which is considered to be good The clay content was measured as 27% which is suitable. The pH is 7.0 and is almost ideal for Perennial rye grass. Phosphorus level was recorded as good, Potassium as high and magnesium as low</p>
<p>20. Appearance and Presentation: <i>The quality of square mowing and presentation in relation to the standard assessed</i></p> <p><i>This is a visual assessment.</i></p> <p><i>The assessment will measure evenness of cut across the square and the surface of the grass leaf, with no bruising, ribbing or washboarding, and to be uniform throughout the whole of the pitch. No stripes are to be present on a prepared pitch.</i></p> <p><i>This is a visual assessment.</i></p>	<p>The general appearance of the square was considered to be very good at</p>
<p>21.Surface Debris: <i>The level of surface debris on the square in relation to the standard assessed.</i></p> <p><i>This may include uncleared leaves and litter, animal droppings, or other detritus.</i></p> <p><i>This is a visual assessment.</i></p>	<p>The square was clean and free of surface debris</p>
<p>22.Post-match repairs: <i>What is the quality of post-match repairs such as footholds and renovation</i></p> <p><i>This is a visual assessment</i></p>	<p>Post match repairs had been undertaken with varying degrees of success. The foot holes that were repaired with loam and adequate moisture were firm and well repaired, other areas repaired with out adequate moisture were unsafe and very dusty and loose. Seed should have been included as this point. Post match repairs were graded as 75%</p>
<p>23. Pitch Markings: <i>Are the pitch markings clear and conform to the laws of the game.</i></p> <p><i>Pitch markings must be of a uniform width throughout their entire length. Minimum width of line is 12mm; maximum width of line is 18mm. Pitch line markings must be clearly visible from a distance of 25 metres. They must conform to the laws of the game and any regulations required by the league authorities.</i></p> <p><i>This is a visual assessment</i></p>	<p>Pitch markings must be between a minimum of 12mm and maximum of 18mm. Some of the creases were 40mm in width. Visibility from 25m was adequate. Pitch marking were graded as 75%</p>

Soil Profiles



A 3mm thatch/fibre layer is present at the surface

Linear breaks occur at 1" (25mm) and 3" (75mm),


Good quality clay loam visible down to a depth of 4½" (115mm) over the indigenous medium clay based loam, with traces of grit.

Generally, the compaction and consolidation of the soil within the core is good.

Figure 1 shows a typical sample core taken from the square, illustrating the profile

Ground Maintenance Equipment The equipment listed below is the minimum recommended items required to maintain a cricket pitch to a safe and consistent condition. Some items may be hired / borrowed at the optimum operation time as opposed to owned.			
	EQUIPMENT	Y/N X(Not assessed OR available)	COMMENTS
1.	MOWERS		Certes,
	a) Cylinder Mower with collection box (suitable for pitch preparation)	Y	Dennis FT510
	b) Cylinder Mower with collection box (suitable for square preparation)	Y	Toro reel master 5300D 5 units
	c) Outfield Mower	Y	
2.	ROLLERS		
	a) Hand roller 75 – 250kg (light)	Y	
	b) Motor roller i) self propelled	Y	
	ii) up to 500kg (medium)	X	
	iii) 1016kg or more (heavy)	X	
3.	SCARIFIERS		Verti cut cassette for Dennis FT510, Have used scarifier from ECB trailer
	a) Hand	Y	
	b) Self propelled	X	
4.	AERATORS		
	a) Spiked roller (pedestrian controlled)	Y	
	b) Pedestrian / self propelled	X	
	c) Tractor mounted	X	
5.	FERTILISER DISTRIBUTORS	Y	Spinning disc
6.	PESTICIDE APPLICATOR	Y	Knapsack with trained operator (PA1,PA6)
7.	SETTING OUT EQUIPMENT	Y	Lines and pegs
8.	MARKING OUT EQUIPMENT	Y	Frame hose
9.	IRRIGATION EQUIPMENT		Water point at square, hose pipes, sprinkler, seepage HOSE
	System to water the square in sufficient quantities.	Y	
10.	HAND TOOLS		
	a) Springbok rake	Y	
	b) Besom broom	Y	
	c) Switch / whale bone brush	Y	All in suitable condition
	d) True lute	Y	
	e) Drag mat / drag brush	Y	
	f) Thumper /heavy panner	X	
11.	OTHER EQUIPMENT		

Health and Safety			Y/N X(Not assessed)	Comments
1.	Machinery	All equipment fitted with guards where necessary	Y	
		Machinery cleaned after use	N	
		Machinery suitably stored	Y	
2.	Fuel	Fuels correctly stored	Y	
3	Pesticides	Pesticides correctly stored	Y	
4	Fire Precautions	Appropriate fire extinguishers available and in date	X	
5	First Aid	Appropriate First Aid kit(s) available	X	
6	Risk Assessments	Risk/COSHH Assessment available and in date	X	
7	Personal Protective Equipment	Is suitable PPE available (where appropriate) and worn	X	
<ul style="list-style-type: none"> The club can seek competent Health and Safety advice from: <ul style="list-style-type: none"> – Your Health and safety representative, – A Registered health and safety consultant, – Fire Officer Your local enforcing authority or the Health and Safety Executive (HSE) 				

Health & safety photo	
	Shed needs tidying up
Figure 2:	

Conclusions

- The square is adequately mown at a cutting height of 12mm
- The sward contained suitable grasses for the level of cricket being played including Perennial Rye, however Annual Meadow grass, Creeping Bent, and some coarse agricultural type rye requires controlling as these produce poor surface playing characteristics.
- The weed population was recorded as 4 % and can be treated with a suitable selective herbicide or Weed and feed product or via hand removal.
- The depth of clay loam has more than doubled since the previous assessment in 2003 and the club have gradually changed from Mendip loam to Ongar loam over a 4 year period.
- The % clay was tested as 21%, this is appropriate and will improve as you start to improve the depth of Ongar loam over a period of time. The average depth of clay loam was 62mm
- Soil pH is 6.1 and is almost ideal for Perennial rye grass.
- Profiles all showed evidence of good consolidation.
- Root growth dept was recorded as 149mm at this depth root density was poor. In the upper portion of the profile root density was much greater. There was evidence of side ways rooting in all profiles in the organic/root zone layer. Root breaks were evident in all profiles, sample 1 at 20mm & 60mm, sample 2 at 20mm & 68mm, Sample 3 at 90mm, sample 4 at 68mm and samples 5 & 6 at 90mm. This indicates that root growth requires encouraging to improve the binding quality between the cricket loam and native soil which in turn will assist with improved playing characteristics of the square.
- The average depth of thatch was recorded as 5mm in the sampled areas. The organic matter rather than being a layer was interspersed with cricket loam. This layer had a very loose crumb structure. The organic matter content of 8% requires reducing via scarification during the renovation period.
- The square has received no application of fertiliser since an application of Autumn/Winter feed in February. Soil analysis indicates that Phosphorus was record as High, Potassium as Low and magnesium as Moderate.
- The surface evenness of 3.5mm over a 3m span on the square is acceptable. The surface levels from the outfield joining the square can be improved over time by hollow tinning the high areas and localised top dressing to the low areas as discussed during my visit.

- Repairs had been undertaken to the ends, this has been partially successful. It is important to judge the correct amount of water to use to allow for binding and that when the repair is dry it doesn't kick out and break down during play.
- The club have suitable equipment available to maintain the square to a good standard.
- The boundary is marked with hydrated lime solution.
- Chemicals are stored incorrectly at the club e.g. Herbicides
- Agricultural chemicals were stored in the Groundsman's shed (EG Carbendazim
-

Recommendations

- Maintain the sward at 9mm-12mm during the playing season.
- Ensure that all repairs are undertaken effectively and promptly.
- When a pitch comes out of play, clean up loose debris, water lightly to moisten surface, sarrel roll to open the surface up, apply fertiliser at half to quarter rate to encourage recovery. Repair ends as discussed during my visit, it is important that when restoring levels that you build up in layers and ensure that each layer is consolidated and keyed in rather than filling depressions with loose loam and levelling off. Over sow with your grass seed mix you have in stock.
- Apply a Nitrogen based fertiliser to the square at recommended rates to encourage growth. Your weed and feed product you have with analysis of 10:4:4 +3.5 Fe would be suitable. If no rain falls within 3 days of application then the product should be watered in well. Your future fertiliser program needs to take into account the soil analysis results. Your amenity supplier will be able to advise you.
- Verti cut throughout the growing season to control the Creeping Bent grass and

Any weed or pest/disease control must be done by a qualified operative in accordance with current pesticide legislation.

coarse Perennial Rye grass taking care not to mark the playing surface.

- When marking out creases keep line within the recommended guidelines. The minimum width of line is 12mm, whilst the maximum width of line is 18mm.
- Refrain from using lime for marking out the boundary.
- Consider the purchase of a suitable chemical storage safe and dispose of agricultural chemical via approved disposal contractor.

End of season Renovation

It is important that all materials required for autumn renovation are ordered and are on site before the end of the season, so work can commence as soon as the season is completed. The Groundsmans association has all of the required specialist kit available; it would be advisable to book early especially the scarified.

Irrigate the square if necessary to soften the top 150mm-225mm. This will also help reduce stress on the grass plant.

Mow the square to remove as much top growth as possible. This operation will increase the efficiency of scarification.

The organic matter content requires controlling by vigorous mechanical scarification during the renovation period. This process will also aid the removal of Annual Meadow grass and gradually improve playing characteristics.

Aerate the square with round solid tines to a depth of 100mm

Surface aerate the square with a sarrel roller to create holes for the seed to germinate in. Only use this method if seeding by hand or use the seeder from the Groundsmans association.

Over sow with your current cricket seed mixture and pay particular attention to pitch ends and worn areas.

Apply a balanced autumn fertiliser at manufacturer recommendations based on nutrient analysis.

Top-dress the square with your "Surrey Loam". It is vital that your Surrey Loam is worked well into the aeration holes.

Regular top dressing with your "Surrey Loam" will facilitate improved depth of clay loam overtime and improved playing surface characteristics.

The levels of unevenness can be improved during the renovation period by careful application of localised top dressing in the appropriate areas and check levels with a straight edge.

To improve levels on the bowlers run up, Aerate the area, this will allow for incorporation of top dressing. This will provide a suitable key to assist with the binding of localised top dressing. Use your top dressing and re-establish the level between the square and outfield. Add approximately 2 inches of soil at a time, each layer must be consolidated and raked to allow for binding of next layer. Finally check levels with a straight edge between square and outfield or use a string line as demonstrated during my visit. Apply a pre seed fertiliser at manufacturers recommendations and over sow with an appropriate outfield grass

seed mixture at recommended rate. It may be prudent to do a couple of pitches each year.

Long Term

1. The square does exhibit some strong root growth, but this requires encouraging. Regular vertical spiking (solid tine) to a depth of no less than 100mm must be carried out at appropriate times of the year i.e. through the autumn and winter making sure aeration with these tines ceases in mid to late January.

Regular aeration will

- a. Relieve compaction
 - b. Improve drainage.
 - c. Allow for gaseous exchange in the soil
 - d. Improve the root depth
 - e. Help provide a key to bind different soils together
 - f. Provide a suitable bed for fertiliser applications.
2. Maintain the square at 15-18mm, top sward when conditions are suitable and growth is present.
3. Remove dew when present if possible.
4. Monitor the square throughout the autumn/winter for pest and disease issues

Should you have any queries regarding either the contents of the report or the execution of the work please contact the undersigned.

Fred Jones	ECB Pitch Advisor Greenshire
Tel:	01234 456789
Email:	fjones@hotmail.com

Other photos



Figure 3: Thin poor quality turf shown using a square quadrat



Figure 4: Poor quality repairs and example of saddles

Interpretation of Soil Analytical Report

Pitch Advisor	Analytical Report Date	Sample Reference
F Jones	06 th June 2016	Seamup CC

Report Section	Unit	Observation	
pH	7.0	This soil pH is chemical neutral, but high for Perennial Rye Grass (Lolium perenne) at 7.0 which perform to it best at 6.5. If the pH continues to raise some nutrients will be unavailable mainly Phosphate.	
Organic Matter % w/w	3.2	The organic matter level is at 3.2 % which is within the standards set by the ECB. High amounts of organic matter will slow the pace and bounce of a pitch particularly if in the form of layers and reduce moisture and nutrient movement.	
Available Phosphate	mg/l	There is no problem with available Phosphate. Maintain present fertiliser program.	
Available Potassium	mg/l	There is no problem with available Potassium. Maintain present fertiliser program.	
Available Magnesium	mg/l	There is no problem with available Magnesium. Maintain present fertiliser program.	
Sand	% w/w	38	This soil is balanced for cricket loam at club level
Silt	% w/w	35	
Clay	% w/w	27	
Textural Class		Clay Loam	

Summary	Monitor pH level and attempt to lower it over the next few years. Maintain present fertiliser program.
----------------	--

Useful Information for Groundstaff

TS4

Download the new TS4 document - Recommended Guidelines for the construction, preparation and maintenance of cricket pitches and outfield at all levels of the game.

Go to: [recommended guidelines for the construction, preparation and maintenance of cricket pitches and outfield](#) (PDF)

THE ESSENTIAL GUIDE TO CRICKET GROUNDSMANSHIP

This new online tool is a must have companion for club groundsmen everywhere, taking you through all aspects of the job with easy to use guidance and practical tips. Available to use on PC's, tablets and smartphones thanks to its responsive design — help will always be at hand!

Go to: <http://www.groundsmanship.co.uk/cricket/cricket-home>



GUIDELINES FOR ROLLING IN CRICKET

The guidelines are the result of four years of research by Cranfield's Centre for Sports Surface Technology commissioned by the ECB, which aimed to develop a scientific understanding of the rolling of cricket pitches in order to optimise pitch preparation. The research marks a significant shift from current practice and understanding in cricket.



Go to: <https://foundation.lancashirecricket.co.uk/media/1653/guidelines-for-rolling-in-cricket.pdf>

PITCH DOCTOR (Essential Guide To Cricket Groundsmanship)

ECB Pitch Consultant, Chris Wood, has worked with NatWest to provide a series of helpful video guides for recreational club groundsmen covering everything from marking out a pitch at the start of the season to putting the pitch to bed in the winter and general maintenance in-between.

Go to: https://www.youtube.com/watch?list=PLLtUhzivrSZTtcaDzUEr_NW-ekVLgOeFd&v=LmKBOPQTAKg

List of Videos available

- Introduction to Site
- Scarification
- Pitch Repair 1 & 2
- Spring Rolling
- Pest and Disease Control
- Pitch End Repairs 1 & 2
- Pitch Preparation
- Rolling
- Winter Maintenance of the Square 1 & 2
- Squaring the Square
- Spring Preparation
- Outfield Renovation
- Mowing a Pitch
- Materials Storage
- Marking a pitch
- Creating a Pitch Plan
- Equipment Maintenance and Repair 1 & 2



IOG – Institute of Groundsmanship

IOG regularly run training courses covering a range of turf maintenance and management issues for cricket groundsmen

<https://www.iog.org/learning>



Performance Quality Standards (PQS) – Guidance Noted for Clubs

Performance Quality Standards (PQS) provides a means of determining the quality of a cricket square or pitch at any given time. They are best described as a tool in the management process and can be used to provide 'benchmarks' against which judgments can be made following the assessment/measurement of the pitch.

PQS do not indicate how to do the job, which machinery or fertiliser to use, but are pre-determined levels of quality to which the finished product should conform. Each PQS has stated method of test of which the majority recommended are British Standards.

When a club receives an advisory/assessment visit by their ECB Pitch Inspector, PQS are used as part of the assessment process to provide a written record of the condition of the square on the date of visit.

Within the PQS are three categories of measurement that relate to the overall quality of a facility. These are:

Structural Quality:

This is the physical make up or structure of the square or pitch, which includes vegetation, soil and organisms. This category determines playing quality and impacts on presentational quality.

This is the largest quality component category.

Presentational Quality:

This is the visual aspect. Players and spectators often perceive the pitch to be good if it is well presented, often without too much consideration being given to many of the underlying structural factors.

Playing Quality

This represents 'playability' - how the pitch will play during the match.

Quality	Detail
Basic	An acceptable level suitable for recreational cricket and where the surface is designed and maintained within tight financial limitations such as Local Authorities
Club (Standard)	A Club pitch suitable for league, school and junior cricket
Premier (High)	Where the surface is intended for Premier League play, with those within the top quartile capable of holding minor county and 1st class one day matches. May include some of the better schools and university pitches
Unsuitable	This is where the surface is deemed unfit or unsafe for play

The club should compare its standards with those identified in ***ECB Technical Specification (TS4)***. Once the club has this information it can identify any problem areas and prepare an action plan to rectify the problem, and hence bring about an improvement in pitch quality, and where required, raise the standard of its square to those described in *TS 4* as 'Premier league Status'.

For example, the pitch may have low bounce and lack pace. A PQS assessment may identify the underlying reasons for this problem such as:

- Unsuitable soil or dressing
- Limited depth of loam
- Layering
- Excessive thatch/organic matter

From this information, the club can plan a course of action on how it will rectify any problems. Once the action plan is prepared, the club can plan for the future, and make decisions based on measurable information. It is important that the action plan is realistic, and within the capabilities of the club and its resources in terms of:

- Time
- Capabilities of the groundstaff
- Finances available
- Availability and suitability of machinery and equipment
- Playing standards and fixture requirements.

PQS may also have important Health and Safety implications, whereby keeping records and proving that the square and the outfield have been responsibly managed, will help in defending a club against any claims for negligence in cases of player injury in this increasing litigious society.

In summary, Performance Quality Standards can be useful for:

- Determining the current quality of the square/pitches
- Compare test results to identify deterioration of the square/pitches
- Set management objectives
- Prepare short and long term plans of a realistic standard expectation including future development
- Introduce a monitoring system including testing, assessment, recording and review.
- Improving the playing quality of the pitches
- Determining the material and equipment/machinery requirements
- Identifying any gradual deterioration of the square/pitches
- Assessing and adjust the effectiveness of the maintenance programme
- Identifying Health and Safety risks and hazards

METHODS OF TEST

Herbage.

(including; Ground Cover, Bare Area, Weed, Moss, Algae/Lichen, Poa annua, Worms, Pests and Diseases, Undesirable Grass Species and Desirable Grass Species.)

The herbage assessments were carried out in general accordance with BS 7370, Part 3 Appendix 6, using a square quadrant.

Depths of Top Soil, Root and Thatch.

The measurement of the top soil, root depth and thatch were carried out in general accordance with BS 7370 Part 3 Appendix 7, using an impact auger and a steel rule.

Evenness.

Evenness was carried out in general accordance with BS 7370 Part 3 Appendix 4, using a three metre straight edge and a graduated wedge.

Length of vegetation.

The length of vegetation was measured in grass measuring prism.

Gradients.

The gradients of the surface were tested in accordance with BS 7370 Part 3 Appendix 5, using a 2 metre straight edge, a 1 metre spirit level, a graduated wedge and a steel rule, where appropriate.

ASSB Soil binding strength tests.

The above were carried out in general accordance with NCC/SFAL method of test C8 for the quality of its binding strength. The rootzone from all the cores at three depths within the profile was amalgamated and tests carried out on the top 25 mm, middle 75 mm and the lower 40/70 mm of the rootzone.

Umpires Pitch Marking Criteria

- These criteria are to be used for marking pitches for a one day premier league game. Always take into consideration the quality and ability of the bowlers, newness of the ball, and prevailing atmospheric conditions that may influence the amount of movement.
- Any variation in performance should be as a result of the quality of the pitch only.

Grading Criteria	Grade	Unevenness of bounce	Seam Movement	Carry and/or Bounce	Turn
Very Good	5	No unevenness of bounce at any stage throughout the match	At most, limited seam movement at all stages of the match	Good carry and/or bounce throughout the match	Little or no turn from the protected area
Good	4	Little unevenness of bounce at any stage throughout the match	Limited seam movement at all stages of the match	Average carry and/or bounce throughout the match	A little turn from the protected area
Above Average	3	At most, occasional unevenness of bounce at any stage throughout the match	At most, occasional seam movement at all stage of the match	Lacking in carry and/or bounce throughout the match	Moderate turn from the protected area
Below Average	2	At most, more than occasional unevenness of bounce at any stage throughout the match	At most, more than occasional seam movement at all stage of the match	Minimal carry and/or bounce throughout the match	Considerable turn from the protected area
Poor	1	Excessive unevenness of bounce for any bowler at any stage throughout the match	Excessive seam movement at all stage of the match	Very minimal carry and/or bounce throughout the match	Excessive assistance to spin bowlers from the protected area
Unsuitable	0	A pitch is only rated unsuitable if: <ul style="list-style-type: none"> • <u>The pitch</u> is excessively wet and slippery whereby players cannot gain a safe foothold. Wet areas may be localised to bowlers run-ups and/or areas on the pitch where the ball is likely to land, or in patches on the outfield • <u>The pitch</u> surface may be or become so dry or loose that the ball “explodes” through the surface and may fly unpredictably and dangerously • <u>Bowlers footholds</u> have not been properly and safely repaired • <u>The Pitch/outfield</u> has been vandalised in any way and is unfit for use 			

Core Samples

If core samples are taken from the square, they are used to assess the soil profile, make up and depth of rootzone, and will determine whether the soil is suitable for cricket. This analysis must be for both the soil texture on the square and the loam being supplied. The following information can be obtained:

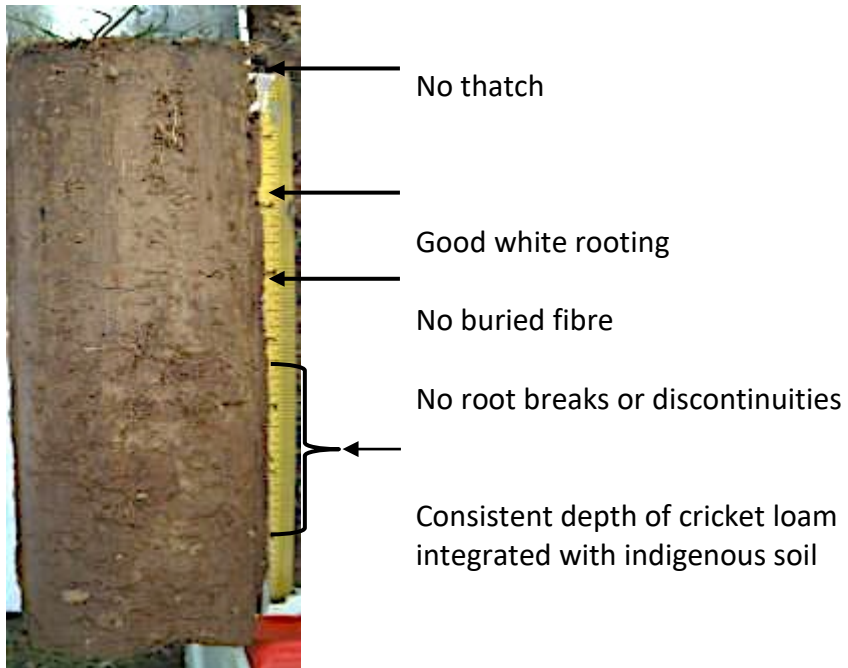
Soil Texture or Particle size analysis: To calculate if the soil has a sufficient % of clay to bind - recommended levels are: (Sand and silt fraction 25 – 50%)		1st class and premier leagues min. of 28-35% Clay Club Standard min. of 25-30% clay Schools min. of 25-28 % clay		
Soil binding strength: The ability of the soil to bind when rolled, and provide suitable pace and bounce. (refer ball bounce below) Calculated by soil supplier or by Motty Test ¹		1st class and premier leagues 65-90 kg Club Standard 56-75 kg		
Rebound bounce (%) = Rebound height x 100% drop height				
Ball bounce	Very fast pace			
	Fast pace	22 – 24%		> 76 cm
	Easy paced	17 – 21 %		64-76 cm
	Slow pace	12-16%		51-64 cm
	Very slow pace	8-11%		38-51 cm
		<8%		<38 cm
Soil pH: .		Level of acidity/alkalinity of the soil Should be above 5.5, with 6.5 being ideal for fine leaved rye grasses		
Organic matter		Can only accurately be analysed in the laboratory and should be between 3- 8%		
Soil nutrients A measure of the soil fertility	P - Phosphate K - Potash Mg – Magnesium A soil analysis report will normally give an index of between 0-5:			

Level	Index Number	Phosphate	Potash	Magnesium
		mg/litre	mg/litre	mg/litre
Deficient	0	0-9	0-60	0-25
Low	1	10-15	61-120	26-50
Fair	2	16-25	121-240	51-100
Good	3	26-45	241-400	101-175
High	4	46-70	401-600	176-250
V High	5	>71	>601	251-350

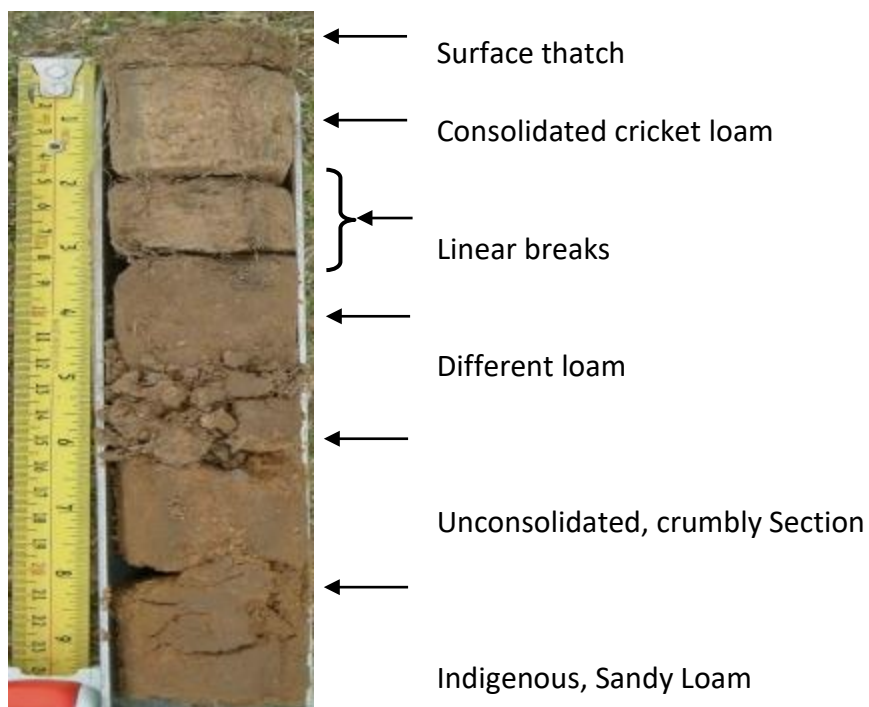
¹ More information on the ASSB Test can be seen on pages 16/17 of TS4

Examples of soil cores

Core sample from a square with consistent good rating



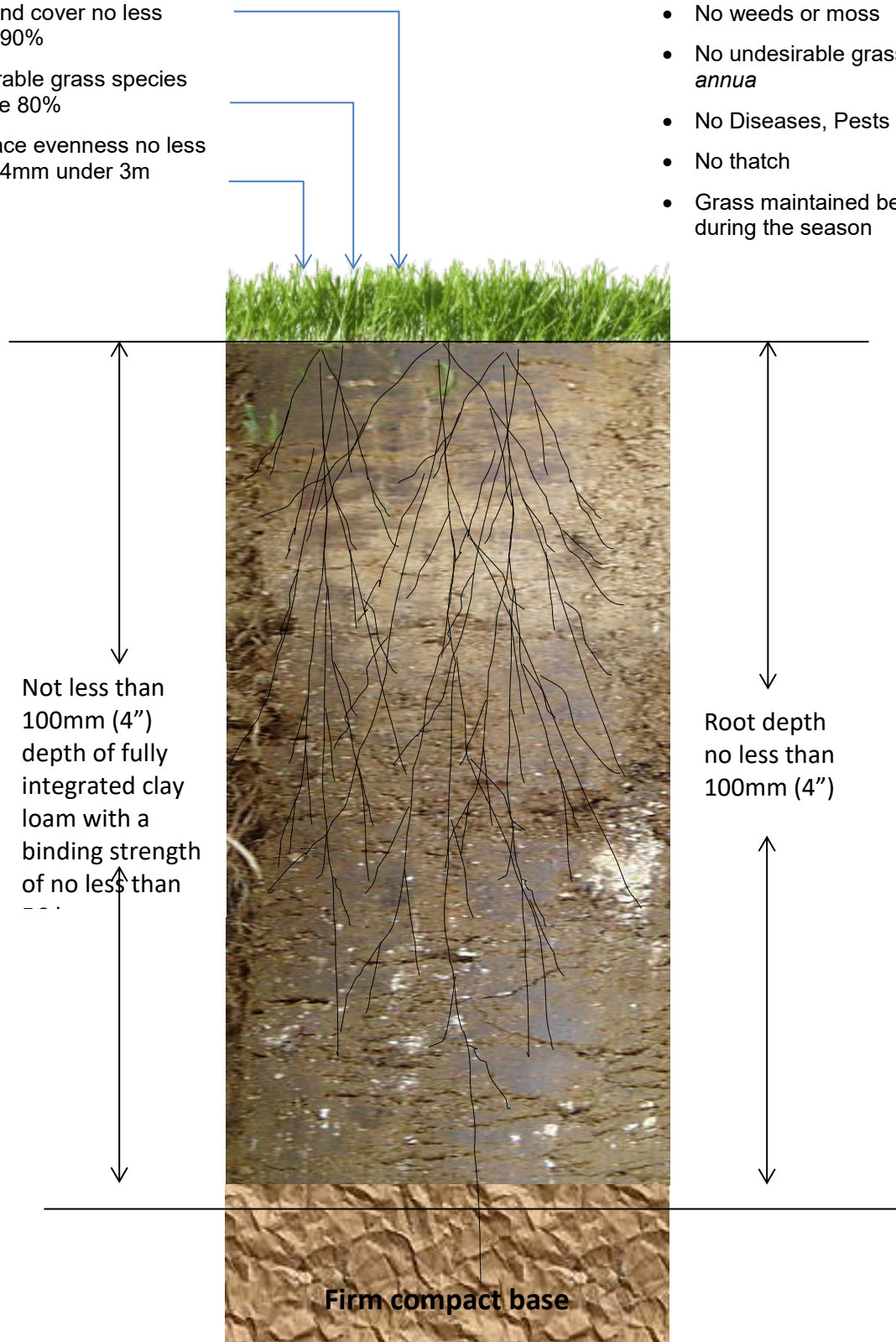
Example core sample from an underperforming club square



Structural requirements for a cricket square on which good club pitches can be produced

- Ground cover no less than 90%
- Desirable grass species above 80%
- Surface evenness no less than 4mm under 3m

- No weeds or moss
- No undesirable grass species e.g. *Poa annua*
- No Diseases, Pests or Worms
- No thatch
- Grass maintained between 10-12mm during the season



Health and Safety on Cricket Grounds

The Health and Safety at Work etc. Act 1974 places general duties of care on employers and the self-employed to conduct their undertakings without risk to the health and safety of others. Voluntary groundstaff may not fall within this group of duty holders, but their activities may create risks to themselves and members of the public. The Health and Safety Executive (HSE) considers it good practice for those who carry out such activities to provide the same level of health and safety protection as they would if they were duty holders under the Act.

The Health and Safety at Work Act etc. places certain duties:

Employers have responsibilities to:

- Provide safe plant and systems of work
- Have arrangements for the use, handling, storage and transport of articles and substances
- Provide adequate information, instruction, training and supervision
- Maintain the workplace for safe access and egress
- Maintain a safe and healthy working environment with adequate welfare facilities

Employees have responsibilities to:

- Take reasonable care of themselves and others
- Co-operate with employer with respect to duties imposed on him
- Not to intentionally interfere with or misuse anything provided in the interest of health, safety or welfare

Guidance can be found on the Health and Safety Executive's website²

<http://www.hse.gov.uk/entertainment/leisure/amateur-sports-club.htm>

Please note that comments or suggestions on Health and Safety are not part of the measured PQS assessment

² <http://www.hse.gov.uk/>

ECB/IOG PQS Table - Cricket Square - Playing Season

			High	Standard	Basic	Unsuitable	
	Performance Standard	Unit	5	3	1	0	What this means
1	Length of grass sward- playing season	mm	>10-12	>8-10 & >12-15	4-8 & >15 - 20	<4 &>20	The height of vegetative growth in the season stated. In dry weather it is often appropriate to increase grass mowing height
2	Total ground cover	%	>95	>85 - 95	75- 85	<75	The extent of vegetation covering the surface, incl. weeds, moss, algae, unwanted grass species as well as desirable grass species The amount of ground cover, averaged over the samples taken, will reduce to as the season progresses.
3	Desirable grasses	%	>95	>80 - 95	60 - 80	<60	The minimum amount of desirable grasses, averaged over the samples taken. Desirable grasses for cricket squares will normally be fine leaved Perennial Ryegrass (<i>Lolium perenne</i>) as the main and sometimes only specie specified. Other species that may typically be specified include, Bents (<i>Agrostis</i> spp), Fescues. (<i>Festuca</i> spp)
4	Undesirable grasses	%	<5	5-20	>20 - 40	>40	The maximum amount of Annual meadow grass (<i>Poa annua</i> , averaged over the samples taken. This is an unwanted grass of cricket squares and to be kept under control as it is shallow rooted in heavy clay loam soils, produces relatively high amounts of thatch, is susceptible to disease and has poor colour compared to desirable grass species. There should be no presence of other unwanted grass species within each sampled area. If there was a small presence, less than half of one square, within each sample then this would still be classed as Nil.
5	Weeds	%	<1	1 to 3	>3 - 5	>5	There should be no weeds, moss, algae and lichen within each sampled area. If there is a small presence, less than half of one square, within each sample then this would still be classed as Nil.
6	Pests & Diseases	%	<1	1 to 3	>3 - 5	>5	There should be no occurrence of pests and disease within each sampled area. Including earthworm casting.
7	Root depth	mm	>100	>75 to 100	50 - 75	<50	Measured healthy root penetration in the sampled core.
8	Thatch	mm	<1	1 to 3	>3 - 5	>5	The maximum thatch, integrated thatch, or buried fibre averaged over the samples taken.
9	Rootzone profile	mm	>100	>80 to 100	65 - 80	<65	Depth of clay loam. Visual evidence of previous top dressing materials, and any layers within the profile.
10	Evenness/3 M straightedge	mm	<1	1 to 3	>3 - 5	>5	The maximum variation above or below a straightedge should be no greater than 4mm using a 3m straight edge.

ECB/IOG PQS Table - Cricket Square - Playing Season

			High	Standard	Basic	Unsuitable	
	Performance Standard	Unit	5	3	1	0	What this means
11	Gradient-length/3 M straightedge	1 in	>100 (Benchmark)		<100 (Basic)		The gradient in the line of play, between wickets using a 3M straightedge
12	Gradient-across/3 M straightedge	1 in	70-90 (Benchmark)		<70 & >90 (Basic)		The gradient across the square in mm a 3M straightedge
13	Soil qualities - PSA - Clay content	%	28-33	>24-27	20-24 & >33-40	<20 & >40	The particle size distribution or soil texture revealed from the soil analysis
14	Soil qualities - Binding strength	Kg	>65 -90	>55 -65	45 - 55	<45	The soil strength or binding quality revealed from the soil analysis
15	Soil qualities - Organic matter	%	3 - 8	>8 -10	>10	<3 - >12	The organic matter level revealed from the soil analysis
16	Soil qualities - pH	No.	6 -7	6 -7	<6 & >7.5	<5.5 & > 7.5	The pH level revealed from the soil analysis
17	Soil qualities - Phosphate	Index No	2	2	<2 & >4	<1 & >4	The indices for Phosphate revealed from the soil analysis
18	Soil qualities - Potash	Index No	2	2	<2 & >4	<1 & >5	The indices for Potash revealed from the soil analysis
19	Soil qualities - Magnesium	Index No	2	2	<2 & >4	<1 & >4	The indices for Magnesium revealed from the soil analysis
20	Appearance and presentation	%	>90	>75 - 90	50 - 75	<50	The evenness of cut and the surface of the grass leaf, with no bruising, ribbing or washboarding, to be uniform throughout the whole of the pitch. No stripes are present
21	Surface Debris	%	<1	1 to 3	>3 - 5	>5	There should be no established/accumulated surface debris, such as litter or tree leaves on the surface of the pitch. Transient windblown materials can be discounted
22	Post match repairs	%	>95	>85 - 95	75- 85	<75	The quality of post-match repairs such as footholds and renovation visually estimated
23	Pitch Markings	%	>95	>85 - 95	75- 85	<75	Pitch markings must be of a uniform width throughout their entire length. The minimum width of line is 12mm, whilst the maximum width of line is 18mm.All the pitch line markings must be marked out with sufficient consistency of material to ensure that they are clearly visible from a distance of 25 metres. They must conform to the laws of the game.

ECB/IOG PQS Table - Cricket Square - Playing Season - Late

			High	Standard	Basic	Unsuitable	
	Performance Standard	Unit	5	3	1	0	What this means
1	Length of grass sward- playing season	mm	12-18	8-12 & 18-25	5 - 8 & 25-30	<5 & >30	The height of vegetative growth in the season stated. In dry weather it is often appropriate to increase grass mowing height
2	Total ground cover	%	>90	75 - 90	60 - 75	<60	The extent of vegetation covering the surface, incl. weeds, moss, algae, unwanted grass species as well as desirable grass species The amount of ground cover, averaged over the samples taken, will reduce to as the season progresses.
3	Desirable grasses	%	>90	75 - 90	60 - 75	<60	The minimum amount of desirable grasses, averaged over the samples taken,. Desirable grasses for cricket squares will normally be fine leaved Perennial Ryegrass (<i>Lolium perenne</i>) as the main and sometimes only specie specified. Other species that may typically be specified include, Bents (<i>Agrostis</i> spp), Fescues. (<i>Festuca</i> spp)
4	Undesirable grasses	%	< 10	10-25	25-40	>40	The maximum amount of Annual meadow grass (<i>Poa annua</i> , averaged over the samples taken. This is an unwanted grass of cricket squares and to be kept under control as it is shallow rooted in heavy clay loam soils, produces relatively high amounts of thatch, is susceptible to disease and has poor colour compared to desirable grass species. There should be no presence of other unwanted grass species within each sampled area. If there was a small presence, less than half of one square, within each sample then this would still be classed as Nil.
5	Weeds	%	<1	1 to 5	5 - 10	>10	There should be no weeds, moss, algae and lichen within each sampled area. If there is a small presence, less than half of one square, within each sample then this would still be classed as Nil. See Method of test No. 3 for an explanation.
6	Pests & Diseases	%	<1	1 to 5	5 - 10	>10	There should be no occurrence of pests and disease within each sampled area. Including earthworm casting.
7	Root depth	mm	>100	75 to 100	50 to 75	<50	Measured healthy root penetration in the sampled core.
8	Thatch	mm	<1	1-2	2-3	>3	The maximum thatch, integrated thatch, or buried fibre averaged over the samples taken.
9	Rootzone profile	mm	>100	80 to 100	65 to 80	<65	Depth of clay loam. Visual evidence of previous top dressing materials, and any layers within the profile.

ECB/IOG PQS Table - Cricket Square - Playing Season - Late

			High	Standard	Basic	Unsuitable	
	Performance Standard	Unit	5	3	1	0	What this means
10	Evenness/3 M straightedge	mm	4 max	8 max	10 max	>10	The maximum variation above or below a straightedge should be no greater than 4mm using a 3m straight edge.
11	Gradient-length/3 M straightedge	1 in	>100 (Benchmark)		<100 (Basic)		The gradient in the line of play between wickets. Ideally this should 1:100 or greater.
12	Gradient-across/3 M straightedge	1 in	70-90 (Benchmark)		<70 & >90 (Basic)		The gradient across the square. Ideally this should be between 1:70 and 1:90
13	Soil qualities - PSA - Clay content	%	28-33	24-28	20-24	20-24 & 34-40	The particle size distribution or soil texture revealed from the soil analysis
14	Soil qualities - Binding strength	Kg	65 - 90	55 - 65	45 -55	<45 & >91	The soil strength or binding quality revealed from the soil analysis
15	Soil qualities - Organic matter	%	3 - 8	>8 -10	<3 - >10	<2 - >12	The organic matter level revealed from the soil analysis
16	Soil qualities - pH	No.	6 -7	6 -7	<6 & >8	<5.5 & >8	The pH level revealed from the soil analysis
17	Soil qualities - Phosphate	Index No	2	2	<2 & >4	<1 & >4	The indices for Phosphate revealed from the soil analysis
18	Soil qualities - Potash	Index No	2	2	<2 & >4	<1 & >5	The indices for Potash revealed from the soil analysis
19	Soil qualities - Magnesium	Index No	2	2	<2 & >4	<1 & >4	The indices for Magnesium revealed from the soil analysis
20	Appearance and presentation	%	>80	>60 - 80	40 - 60	<40	The evenness of cut and the surface of the grass leaf, with no bruising, ribbing or washboarding, to be uniform throughout the whole of the pitch. No stripes are present
21	Surface Debris	%	<1	1 to 5	5 - 10	>10	There should be no established/accumulated surface debris, such as litter or tree leaves on the surface of the pitch. Transient windblown materials can be discounted
22	Post match repairs	%	>80	>60 - 80	40 - 60	<40	The quality of post-match repairs such as footholds and renovation visually estimated
23	Pitch Markings	%	>80	>60 - 80	40 - 60	<40	Pitch markings must be of a uniform width throughout their entire length. The minimum width of line is 12mm, whilst the maximum width of line is 18mm.All the pitch line markings must be marked out with sufficient consistency of material to ensure that they are clearly visible from a distance of 25 metres. They must conform to the laws of the game.