

ECB/GMA Performance Quality Standards

Cricket Square – Playing Season

BAE Sports Ground Warton

Fulwood and Broughton CC



Performance Quality Standard Report for Alexandra Park

Date of visit	30 June 2021
Time of visit	18.00 hours
Weather conditions	Dry and Sunny
Grounds conditions	Damp
Pitch Advisor	Adam Cooper
Others present	Ground Manager

Introduction

This report looks at the cricket square and Outfield at The BAE Sports Ground, Bank Lane, Warton. This report has been requested to ascertain the amount of work required to upgrade the pitch and equipment to a standard which can host BAE/EE Preston CC 1st team for the 2022 season from its current use as a third team ground for Fulwood and Broughton CC playing lower league cricket.

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/Grounds Management Association.

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

History

The cricket ground has been in existence for over 50 years. It has always been in its current position. The ground had a full time groundsman up until 10 years ago and was maintained to a very good standard. Due to a decline of the Sports and Social section of the factory and the collapse of the works team, the site has only been used as a hired facility by several local clubs with BAE providing a part time groundsman who looks after the grounds but not the cricket square as it is beyond his knowledge. The square has been maintained as best as it could over the last 10 years by Fulwood and Broughtons CCs volunteer groundsman with limited resources and time. It has been kept to a standard sufficient for lower league level cricket but will need increased renovation and maintenance work if it is to be used for Division 1 or Potential Premier Division Cricket if the intended user BAE/EE Preston CC get promoted at the end of the current season.

Methodology

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

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



ECB/IOG PQS Table - Cricket Square - Playing Season

BAE Warton Cricket Square		Unit	Mark	PQS Grade	
1	Length of grass sward	mm	20	Unsuitable	
2	Total ground cover	%	85	Club	
3	Desirable grasses	%	60	Basic	
4	Undesirable grasses	%	15	Club	
5	Weeds	%	3	Basic	
6	Pests & Diseases	%	1	Club	
7	Root depth	mm	60	Basic	
8	Thatch	mm	5	Basic	
9	Rootzone profile	mm	90	Club	
10	Evenness/3 M straightedge	mm	5	Club	
11	Gradient-direction of play/3 M	1: 100	mm	30	Not Categorised
12	Gradient-across play/3 M	1: 300	mm	10	Not Categorised
13	Soil qualities - Clay content	%	26	Club	
14	Soil qualities - Binding strength	Kg		Not assessed	
15	Soil qualities - Organic matter	%	8	Premier	
16	Soil qualities - pH	No.	6.0	Premier	
17	Soil qualities - Phosphate	Index No	2	Premier	
18	Soil qualities - Potash	Index No	3	Club	
19	Soil qualities - Magnesium	Index No	3	Club	
20	Appearance and presentation	%	65	Basic	
21	Surface Debris	%	5	Basic	
22	23	%		Not assessed	
23	Pitch Markings	%	85	Club	
Pitch Standard Assessed:		Club			
Performance Quality Standard:		Club			
Pitch Advisor:		Adam Cooper			
Date of Assessment:		01/07/2021			

Observations on assessment findings Playing season

Items	Comments
<p>1.Cutting Height Mown height measured in mm of the grass currently maintained during the non-playing season in relation to the standard of pitch being assessed.</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 20mm. This should be kept between 12 and 15 mm</p>
<p>2.Ground Cover The % current ground cover and the % current bare area in relation to the standard of the pitch being assessed. Includes all vegetation including grasses, weeds, moss, and algae</p>	<p>Overall ground coverage on the square was assessed as 85%. This is basic standard for this time of year and probably due to the fact that end of season renovations have been limited now for 2 seasons.</p>
<p>3.Desirable Grasses The % desirable grass species present on the square in relation to the standard assessed? 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.</p>	<p>The desirable grass species suitable for cricket within the sward were Dwarf Perennial Rye grass (Lolium perenne) at 60%,</p>
<p>4.Un-Desirable Grasses The % undesirable (weed) grass species such as Poa annua or weed grasses in relation to the standard assessed? 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. Hence Poa annua is considered to be a weed grass on cricket squares and should be kept to a minimum Other coarse leaved pasture grasses should</p>	<p>The undesirable grass species observed in the sward were Annual Meadow grass (Poa annua) at 15% 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 it's an annual and completes its life cycle within a year, prone to harbour pest and disease as a result of its growth habit.</p>
<p>5.Weeds The % weed infestation? Including moss, algae, and lichen in relation to the standard assessed 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.'</p>	<p>A 3% weed population was observed across the assessed area. The main weed present was moss.</p>
<p>6.Pests and Diseases The % of pests and disease including worms' casts in relation to the standard assessed Likely pest and disease problems with cricket squares include fairy rings, Fusarium disease, and especially worm casts.</p>	<p>A 1% disease population was observed across the assessed areas, including earthworm casting.</p>
<p>7.Thatch: The depth of thatch in mm relation to the standard assessed 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. 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.</p>	<p>There was a build-up of a 5mm layer of thatch at the surface (refer to the photo of the sample core).</p>
<p>8.Root Depth The depth of roots in relation to the standard assessed This measures healthy and <u>continuous</u> root penetration at depth into the soil profile.</p>	<p>Average root growth was recorded as 60 mm at this depth root density was very weak. Again, this is low for the time of year and the recent climatic conditions and likely to be as a result of no winter spiking taking place due to covid restrictions</p>
<p>9.Rootzone Profile The depth of rootzone fully integrated to 100 mm depth</p>	<p>The depth of root zone was a constant 90mm across the sampled areas against a recommended level of 80-100mm.</p>

<p>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.</p>	
<p>10. Evenness The range of Evenness measured under a 3M straightedge in relation to the standard assessed.</p> <p>This measurement identifies depressions and hollows on the square, and saddles at the ends of the pitches</p>	<p>Surface evenness showed a maximum variation of 5mm using a 3m straightedge.</p>
<p>11/12 Gradients The range of localised gradients across and down the line of play in relation to the standard assessed?</p> <p><u>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.</u></p>	<p>Gradients of Flat in the line of play and 1:100 across the line of play were recorded.</p>
<p>13/19 Soil Qualities from Sampling results 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.</p>	<p>The soil organic matter was recorded as 8.0% which is considered to be high. The clay content was measured as 32% which is Good. The pH is 6.9 and is almost ideal for Perennial rye grass. Phosphorus level was recorded as good, Potassium as good and magnesium as good</p>
<p>20. Appearance and Presentation The quality of square mowing and presentation in relation to the standard assessed</p> <p>This is a visual assessment.</p> <p>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.</p> <p>This is a visual assessment.</p>	<p>The general appearance of the square was considered to be average to poor. There is a large proportion of weed grass and moss patches which will affect playing consistency.</p>
<p>21. Surface Debris The level of surface debris on the square in relation to the standard assessed.</p> <p>This may include uncleared leaves and litter, animal droppings, or other detritus.</p> <p>This is a visual assessment.</p>	<p>The square had minimal surface debris</p>
<p>22. Post-match repairs What is the quality of post-match repairs such as footholds and renovation?</p> <p>This is a visual assessment</p>	<p>Post-match repairs had been undertaken to a good standard</p>
<p>23. Pitch Markings Are the pitch markings clear and conform to the laws of the game?</p> <p>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.</p> <p>This is a visual assessment</p>	<p>Pitch markings must be between a minimum of 12mm and maximum of 18mm. Visibility from 25m was adequate. Pitch marking were graded as 90%</p>

Soil Profiles

A 5mm thatch/fibre layer is present at the surface



Good quality clay loam visible down to a depth of (100mm) over the indigenous sand based loam, with traces of grit.

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

Roots are weak and struggling to penetrate below 60mm

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.

	Items	Y/N	Comments
1	Mowers		
	a) Cylinder Mower with collection box (suitable for pitch preparation)	Y	
	b) Cylinder Mower with collection box (suitable for square preparation)	Y	
	c) Outfield Mower		
2	Rollers		
	a) Hand roller 75 – 250kg (light)	Y	
	b) Motor roller i) self-propelled		
	ii) up to 500kg (medium)		
iii) 1016kg+ (heavy)	Y		
3	Scarifiers		
	a) Hand	Y	
b) Self propelled	N		
4	Aerators		
	a) Spiked roller (pedestrian controlled)		Hired when necessary
	b) Pedestrian / self-propelled	N	
c) Tractor mounted			
5	Fertiliser Distributors	Y	
6	Pesticide Applicator		
7	Setting Out Equipment	Y	
8	Marking Out Equipment	Y	
9	Irrigation Equipment		
	System to water the square adequately	Y	Water point at square, hose pipes, sprinkler,
10	Hand Tools		
	a) Springbok rake	Y	All in suitable condition.
	b) Besom broom		
	c) Switch / whale bone brush		
	d) True lute	Y	
	e) Drag mat / drag brush	Y	
f) Thumper /heavy panner	Y		
11	Other Equipment		

Health and Safety

No health and safety assessment was done

Health and Safety			Y/N	Comments
1	Machinery	All equipment fitted with guards where necessary	Y	
		Machinery cleaned after use	Y	
		Machinery suitably stored	Y	
2	Fuel	Fuels correctly stored	Y	
3	Pesticides	Pesticides correctly stored		Done by Contractor
4	Fire Precautions	Appropriate fire extinguishers available and in date	Y	
5	First Aid	Appropriate First Aid kit(s) available	Y	
6	Risk Assessments	Risk/COSHH Assessment available and in date		Not Seen
7	Personal Protective Equipment	Is suitable PPE available (where appropriate) and worn	Y	

The club can seek competent Health and Safety advice from:

- Your Health and safety representative,
- A Registered health and safety consultant,
- Fire Officer
- Your local enforcing authority or the Health and Safety Executive (HSE)

Conclusions

- The Square is in good condition as a base facility but is in need of increased maintenance and renovation if it is to be used for a higher standard of cricket.
- There is a definite need for an enhanced full renovation to take place at the end of the current season.
- The machinery was assessed and found to need improvement if the facility is to be maintained to a higher standard.
- The outfield was also assessed, and recommendations will follow.
- The weed population was recorded as 3 % and can be treated with a suitable selective herbicide.
- Profiles all showed evidence of good consolidation.
- Root growth depth was recorded as 60mm and root density was poor.
- The average depth of thatch was recorded as 5mm in the sampled areas and is the main barrier to a higher level of cricket being played than which is currently played. Thatch leads to inconsistent playing surfaces.
- The existing fertiliser program is suitable.

Recommendations

- An increase in the regular maintenance tasks are needed to include weekly tasks such as
 1. Cutting the square to 12 to 15mm at least once per week
 2. Repairing pitches as soon as possible after use
 3. Preparation of tracks in line with a fixture plan starting at least 10 days before a fixture is scheduled, to include watering, cutting, rolling and marking out.
 4. Verti-cutting square to reduce thatch build up and control weed grasses.
 5. Square watering in dry periods.

This will be easily achievable by the current groundsman with the help of the BAE/EE Preston Grounds Team during the 2022 season.

- Plan now for the end of season renovations(as below) which are vital to get this square in good enough condition for higher level cricket.
- Consider what winter work will be needed such as solid tine aeration to help with winter drainage and help root development and put plans in place as suitable machinery may need to be hired.
- To assist in preparation of good quality pitches after the enhanced renovation has taken place, the purchase of a mechanical scarifier is needed.

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.

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

Fraize Mow the square to remove as much top growth and thatch level as possible to a depth of 5mm.

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. Cover the square with at least 2 passes at slight angles to each other, finishing in the line of play.

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

Surface aerate the square with a sarel roller to create holes for the seed to germinate in.

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 compatible loam to match the existing at a rate of 10 to 12 bags per pitch, which should equate to 120 bags or 3 tons for the 10 track square.

After the new seed has germinated and established which is usually by the end of November, start an aeration program to aid winter root development. This should be done at least once per month if conditions allow during November to January using solid tines to a depth of no less than 100mm.

Outline Costs

Contractor Fraize Mowing to remove thatch surface	£1,800
Application of 3 bags of seed and 2 bags of fertiliser including materials	£ 500
Application of 3 tons of Surrey Loam to match existing including loam	£ 900
Extra Maintenance during growing in period	£ 300
Winter Spiking as described including Machinery Hire, 2 Visits @ £200 Each	£ 400
Total Square works	£3,900 plus VAT

These costs have been discussed with a trusted contractor and are as accurate as can be given at this stage.

The purchase of a decent 2nd hand mechanical scarifier needed to produce Tracks of the desired quality. £2000 to £2500

Further Autumn/Winter Tasks to be carried out between FBCC and BAE/EE Preston CC

Regular aeration will have the following benefits

- Relieve compaction
- Improve drainage.
- Allow for gaseous exchange in the soil
- Improve the root depth

Other Regular winter tasks should be carried out

1. Maintain the square at 15-18mm, top sward when conditions are suitable and growth is present.
2. Remove dew when present if possible.
3. Monitor the square throughout the autumn/winter for pest and disease issues.

Outfield Works

The outfield is currently maintained by the part-time BAE Warton Groundsman and is done to a very mediocre standard with very aging equipment and is very unlikely to be upgraded in the near future. The purchase or lease of suitable mowing equipment to increase the standard of the outfield for the 2022 season and beyond would be desirable.

For the purchase of a 1.8m Rotary Roller mower which would provide a suitable quality and height of cut to attach to the current tractor would be in the region of £5,500 plus VAT
Leasing cost is unknown at present.

Other Photos



A close up of a prepared pitch showing the mixed surface vegetation which will cause issues if a higher standard of cricket is to be played and so must be removed.



A profile picture close up of the surface debris to be removed by the fraize mowing process.

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

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Useful Information for Ground Staff

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. [Click here](#)

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! [Click here](#)



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.

[Click here](#)



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. [Click here](#)

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



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

[Click here](#)

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
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
Club (Standard)	A Club pitch suitable for league, school, and junior cricket
Basic	An acceptable level suitable for recreational cricket and where the surface is designed and maintained within tight financial limitations such as Local Authorities
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 ground staff.
- 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 Topsoil, Root and Thatch

The measurement of the topsoil, 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 25mm, middle 75mm and the lower 40/70mm 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	<p>A pitch is only rated unsuitable if:</p> <ul style="list-style-type: none"> The pitch 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 The pitch surface may be or become so dry or loose that the ball "explodes" through the surface and may fly unpredictably and dangerously Bowlers footholds have not been properly and safely repaired The Pitch/outfield 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:

<p>Soil Texture or Particle size analysis: 1st class and premier leagues min. of 28-35% Clay</p> <p>To calculate if the soil has a sufficient % of clay to bind - recommended levels are: Club Standard min. of 25-30% clay</p> <p>(Sand and silt fraction 25 – 50%) Schools min. of 25-28 % clay</p>																																				
<p>Soil binding strength: 1st class and premier leagues The ability of the soil to bind when rolled and provide suitable pace and bounce. 65-90 kg (refer ball bounce below) Calculated by Club Standard soil supplier or by Motty Test¹ 56-75 kg</p> <p style="text-align: center;">Rebound bounce (%) = Rebound height x 100% drop height</p> <table border="0"> <tr> <td rowspan="5">Ball bounce</td> <td>Very fast pace</td> <td></td> <td></td> </tr> <tr> <td>Fast pace</td> <td>22 – 24%</td> <td>> 76 cm</td> </tr> <tr> <td>Easy paced</td> <td>17 – 21 %</td> <td>64-76 cm</td> </tr> <tr> <td>Slow pace</td> <td>12-16%</td> <td>51-64 cm</td> </tr> <tr> <td>Very slow pace</td> <td>8-11% <8%</td> <td>38-51 cm <38 cm</td> </tr> </table>		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% <8%	38-51 cm <38 cm																			
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<p>Soil pH: Level of acidity/alkalinity of the soil Should be above 5.5, with 6.5 being ideal for fine leaved rye grasses</p>																																				
<p>Organic matter Can only accurately be analysed in the laboratory and should be between 3- 8%</p>																																				
<p>Soil nutrients A measure of the soil fertility</p>	<p>P - Phosphate K - Potash Mg – Magnesium</p> <p>A soil analysis report will normally give an index of between 0-5:</p>																																			
<table border="1"> <thead> <tr> <th>Level</th> <th>Index Number</th> <th>Phosphate mg/litre</th> <th>Potash mg/litre</th> <th>Magnesium mg/litre</th> </tr> </thead> <tbody> <tr> <td>Deficient</td> <td>0</td> <td>0-9</td> <td>0-60</td> <td>0-25</td> </tr> <tr> <td>Low</td> <td>1</td> <td>10-15</td> <td>61-120</td> <td>26-50</td> </tr> <tr> <td>Fair</td> <td>2</td> <td>16-25</td> <td>121-240</td> <td>51-100</td> </tr> <tr> <td>Good</td> <td>3</td> <td>26-45</td> <td>241-400</td> <td>101-175</td> </tr> <tr> <td>High</td> <td>4</td> <td>46-70</td> <td>401-600</td> <td>176-250</td> </tr> <tr> <td>V High</td> <td>5</td> <td>>71</td> <td>>601</td> <td>251-350</td> </tr> </tbody> </table>		Level	Index Number	Phosphate mg/litre	Potash mg/litre	Magnesium 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
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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.



- ← No thatch
- ← Good white rooting
- ← No buried fibre
- ← No root breaks or discontinuities
- ← Consistent depth of cricket loam integrated with indigenous soil

Example core sample from an underperforming club square.

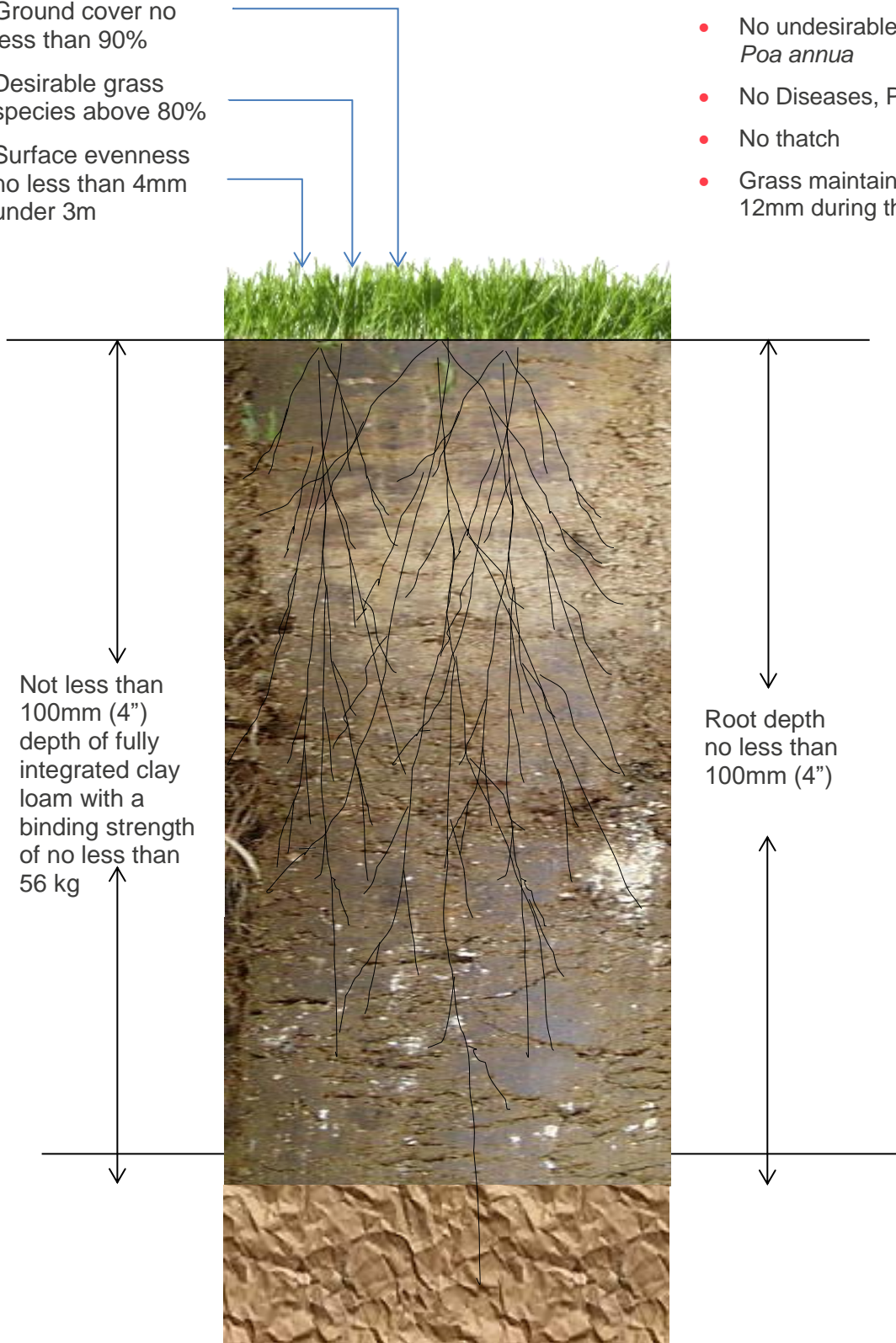


- ← Surface thatch
- ← Consolidated cricket loam
- ← Linear breaks
- ← Different loam
- ← Unconsolidated, crumbly Section
- ← Indigenous, Sandy Loam

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 ground staff 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 PQS assessment

² <http://www.hse.gov.uk/>

ECB/GMA 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 spp</i>), Fescues. (<i>Festuca spp</i>)
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.

		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/GMA 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.

		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
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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 25 metres. They must conform to the laws of the game.