



## Feasibility Report for 2 Winter Pitches at Llangynwyd Rangers BGCW FC, Maesteg



**Prepared by**

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**Oolong Sports Pitch Consultancy**  
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## **Disclaimer**

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## 1. Scope of the Report

Oolong Sports Pitch Consultancy was commissioned to undertake a feasibility study for Llangynwyd Rangers BGCW FC to assess the quality of the existing grass pitches and to propose improvement works. The inspection focused on the drainage situation, ground surface levels (topography), soil conditions and grass health. Soil assessment investigations were undertaken to determine soil depths and conditions. Soil samples were sent for laboratory analysis to determine soil fertility status and confirm soil textural class.

Historical information about the site was gained through conversations with club staff.

Recommendations and outline costings for improvements are included which take into account the potential future use of the playing surfaces and requirements of Llangynwyd BGCW FC.

The following table shows the sequence of events required for a successful sports pitch improvement project.

**It is essential that a qualified and experienced Sports Pitch Consultant is engaged to undertake these duties as this is a specialised profession. It is not appropriate to use a Civil Engineer or Contractor. The Project Management and Supervisory duties are of particular importance in ensuring the implementation of a successful scheme.**

Item	Description
Feasibility Study and Report based on the PQS	Desk study and field assessment of pitch quality including recommendations and outline costings for capital improvement works
Design and Specification Document	Details design drawings, materials and workmanship specifications and a Bill of Quantities. The 'Specification' is a stand-alone document used for the competitive tendering process and contract management purposes
Project/Contract Management and Works Supervision	To oversee the technical and logistical aspects of the project and manage the contract. To supervise the construction works and react to unplanned events
Maintenance Inspection Visits	Post-construction inspection visits

**Table 1** – The essential stages of a successful pitch improvement project

## 2. Site Visit Details

**Client:** Llangynwyd Rangers BGCW FC. The Coalfields Re-generation Trust and Bridgend County Borough Council

**Site Address:** Llangynwyd Playing Fields  
Maesteg Road  
Llangynwyd  
Maesteg  
CF34 9SN

**Site Contact:** Mr Ryan Jones (Game On programme manager, the Coalfields Regeneration Trust)

**Present at visit:** Mr Ryan Jones (Coalfields Regeneration Trust)  
Mr Peter Watkin Jones (Oolong Sports)

**Date of visits:** 29 January 2020

**Consultant:** Mr Peter Watkin Jones (Oolong Sports)

## Summary

Typically both pitches suffer from a lack of adequate drainage resulting in waterlogged and muddy playing conditions. The lack of active drainage means that the ground does not recover well after heavy rainfall events and is reliant on surface run-off and evaporation to remove standing water. As a result the pitch recovery can be slow and games postponed. Both pitches would be significantly improved by installing suitable drainage systems. This should include a primary piped system supplemented with a secondary system of slit drains or sand grooves.

The surface topography (pitch slopes and flatness) require attention. The soccer pitch is steep across the pitch and has undulations (ripples or waves) over the entire pitch making play difficult and is below the PQS. The surface of the rugby pitch is similarly sloping and particularly so to the east (see **Figures 3 and 6**).

Addressing these features would dramatically improve the pitch quality and increase the reliability of fixtures and, provided an adequate maintenance regime is followed, will give years of dependable performance.

The PQS provides the basic minimum standard for the construction and maintenance of grass turf playing surfaces. Principally this recommends that a natural grass pitch must:

1. Have adequate grass cover
2. Have low levels of weed coverage
3. be reasonably flat
4. Have the ability to drain surface water

It is divided into 3 categories: High, Standard (Mid), and Basic

### Soccer Pitch

The table below highlights the elements of the soccer pitch which need to be addressed to achieve the minimum PQS requirements.

Item	PQS Category on the day of the visit
Ground cover	Basic
Undesirable weeds and grasses	Mid
Root depth	Mid
Thatch depth	High
Topsoil depth	High
Gradient lengthways	High
Gradient cross pitch	Below Basic
Drainage (Infiltration Rate)	Below Basic

**Table 2 – Current PQS status of the soccer pitch**

## Rugby Pitch

The table below highlights the elements of the rugby pitch which need to be addressed to achieve the minimum PQS requirements.

Item	PQS Category on the day of the visit
Ground cover	High
Undesirable weeds and grasses	Mid (Moss element within Basic category)
Root depth	Mid
Thatch depth	High
Topsoil depth	High
Gradient lengthways	Below Basic
Gradient cross pitch	Mid
Drainage (Infiltration Rate)	Below Basic

**Table 3 – Current PQS status of the rugby pitch**

### 3. Introduction

Llangynwyd Rangers BGCW FC is a community based football club based in Maesteg. The club was formed in 1947 and now have over 260 members aged between 5 and 45 years. The club runs 9 junior teams who compete in the Bridgend and Port Talbot Junior League. The senior team play in the South Wales Alliance Football League Premier Division.

There is a changing block facility, a single soccer pitch and a single rugby pitch on the site. The River Llynfi is situated to the north east adjacent to a main railway line.

Both pitches suffer significant waterlogging conditions which cause postponement of fixtures.



**Figure 1 - Outline of the pitches at Llangynwyd Rangers BGCW FC**



## 4. Methodology

The proposed area has been quantified and a site report compiled by using the following methods and has not been judged through observations taken while a game has been in progress:

- Visual assessment of grass coverage to assess the proportions of grass species and weeds.
- Field assessment of the soil profile down to 450 mm with sampling of the topsoil and subsoil.
- Non-intrusive investigation into any existing drainage system and outfall facility.
- Laboratory analysis of soil samples recovered from the pitch.
- Use of National Soil Resources Institute Soil Maps
- Information reviewed using Performance Quality Standards (PQS) which are set out by The Institute of Groundsmanship, WRU.

A full copy of the standard can be seen on [www.iog.com](http://www.iog.com)

## 5. Ground Conditions

### Soil Profiles

Two representative soil profiles were assessed using hand augering techniques and samples sent off for analysis. Both profiles were found to be similar in makeup with dark brown Sandy loam topsoil to a minimum depth of 300mm above medium firm Sandy clay subsoil, see **Table 1**. Results from the laboratory tests include soil texture, organic matter content and nutrient status.

The British Geological Society classifies the local bedrock geology as Llynfi Member Sandstone Formation and Superficial Geology as Till, Devensian – Diamicton superficial deposits.



**Figure 2 - Typical soil profile of the soccer pitch**

Topsoil depths measured in the field were found to be approximately 300mm deep with some stone from 250mm and consistent across the site. The upper 100mm soils were noticeably de-structured with poor shear strength capacity.

Subsoil depths were assessed to a maximum of 450mm below ground level using a combination of hand augering and open trial holes, the profiles showed a consistent layer of Clay loam subsoil throughout.





**Figure 2 – Typical topsoil structure**

The upper 100mm of topsoil is compacted and shows signs of long term sustained damage. Below 100mm the profile shows compacted and poorly structured soil. The rooting depth is typically 130mm.

The Clay subsoil below 300mm is also poorly structured and will impair drainage.

Thatch is a layer of intermingled dead and living shoots, stems and roots which develop between the zone of green vegetation and the soil surface and can impede drainage. The observed thatch content was less than 5 mm deep which conforms to the highest PQS category.

The presence of organic matter within the topsoil at 4.2 to 6.1% is not excessive and will not unduly impair the infiltration of water through the soil, however combined with the surface thatch, the de-structured nature of the soil it will reduce the overall drainage capacity of the upper soil profile. There is some evidence that the upper profile does become saturated, holding elevated levels of moisture and associated reduction in wearing capacity.

### **Nutrient status**

#### **Soccer Pitch**

The topsoil has a pH level of 6.5 which is ideal for Perennial Rye-grass and optimises the availability of micro-nutrients such iron, manganese and zinc. The ideal value for sports turf grass mixes including perennial rye grass is around pH 6.5 which allows for the optimum availability for (P) Phosphorus, (K) Potassium and (Mg) Magnesium. The reported soil index for P and K is 1 and slightly below the optimum of 2.

## Rugby Pitch

The topsoil has an elevated pH level of 7.4 above the optimum for sports grasses. The soil is deficient in Magnesium and Potassium.

Deficiencies in nutrient status can be addressed as part of a maintenance programme through targeted fertilizer applications. Laboratory results can be seen in the Appendices of this report.

Trial Pit/Lab Ref	Depth (m)	Sand (%)	Silt (%)	Clay (%)	Classification
TP1/S2 Soccer Pitch	0 – 0.250	55	28	17	Sandy loam
	0.250 – 0.360				Sandy loam with much angular 20mm stone
	0.360 – 0.450				Clay loam
TP2/S3 Rugby Pitch	0 - 0.300	64	23	13	Sandy loam
	0.300 – 0.430				Clay loam

**Table 1 – Soil profile textures**

## Topography

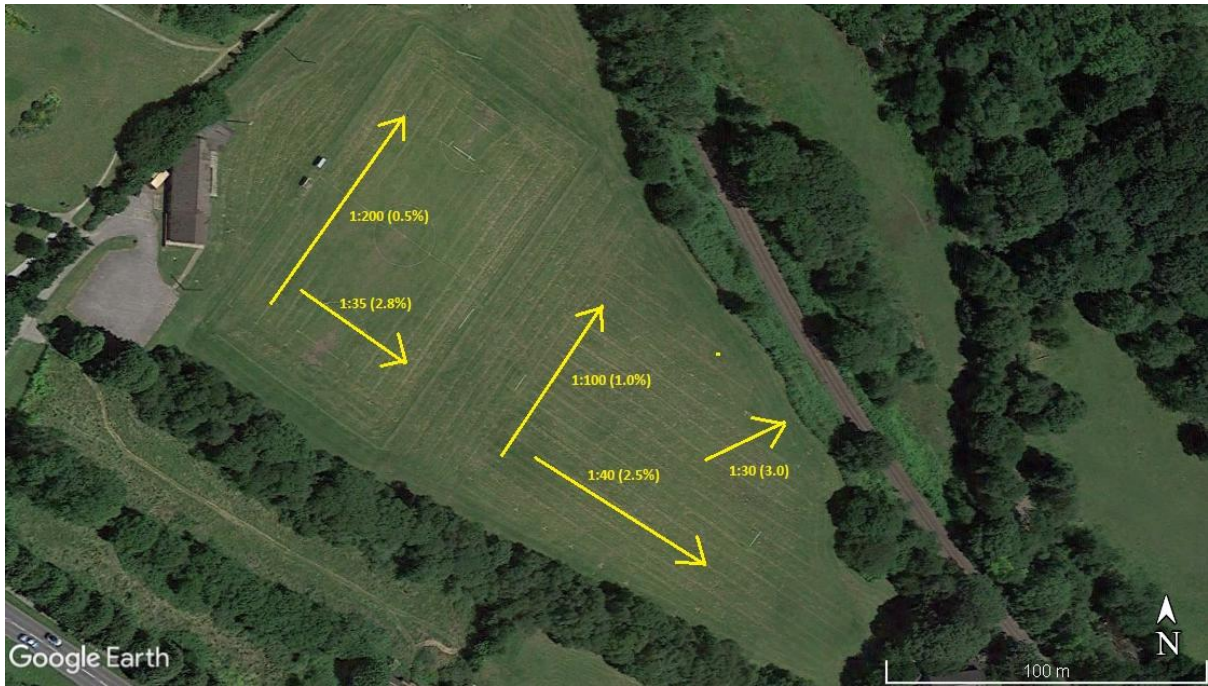
The site has a general slope north west to south east and is significant. The steepest gradients are found at the eastern boundary of the rugby pitch which increases towards the site boundary.

The soccer pitch has a cross field slope of approximately 1:35 and has marked undulations throughout (it is not flat).

The rugby pitch has a lengthways slope of approximately 1:40 with a cross-field slope of 1:100 but falls off dramatically at the eastern boundary, see **Figures 3 and 6**.

Both pitches fall below the minimum standards bench marked by the Institute of Groundsmanship (IOG) Performance Quality Standards (PQS) on pitch slope.





**Figure 3 – General ground slopes**



**Figure 4 – View of the soccer pitch**



**Figure 5 – The changing rooms also showing pitch undulations**



**Figure 6 – Steepest gradients on the rugby pitch**



## Grass Coverage

### Soccer Pitch

The area has vegetative coverage of 75% which lies within the basic category of the IOG specification, the approximate coverage is made up of the following grasses:

75%	PERENNIAL RYEGRASS	<i>Lolium perenne</i>
5%	BROWNTOP BENT	<i>Agrostis capillaris</i>
5%	FESCUE	<i>Festuca spp</i>

5% Weed grasses made up of:

ANNUAL MEADOW GRASS	<i>Poa Annua</i>
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Undesirable grass species and broadleaved weeds cause competition between themselves and the essential grass cultivar species present and should be eliminated. Annual meadow grass (*Poa annua*) is considered a weed grass within the sports turf industry, although it remains present in a large percentage of sports surfaces all over the UK.

5% broadleaved weeds present, mainly:

DANDILION	<i>Taraxacum officinale</i>
DAISY	<i>Bellis perenis</i>
PARSLEY-PIERT	<i>Aphanes avensis</i>



**Figure 7 – Typical grass cover**





**Figure 8 – Showing bare ground within the goal areas**



**Figure 9 – General view of the soccer pitch**



## Grass Coverage

### Rugby Pitch

The area has vegetative coverage of 90% which lies within the highest category of the IOG specification, the approximate coverage is made up of the following grasses:

80%	PERENNIAL RYEGRASS	<i>Lolium perenne</i>
5%	BROWNTOP BENT	<i>Agrostis capillaris</i>
10%	FESCUE	<i>Feuscia spp</i>

5% Weed grasses made up of:

ANNUAL MEADOW GRASS	<i>Poa Annua</i>
YORKSHIRE FOG	<i>Holcus lanata</i>

Moss and weeds present:

DANDILION	<i>Taraxacum officinale</i>
DAISY	<i>Bellis perenis</i>
PARSLEY-PIERT	<i>Aphanes avensis</i>
CLOVER	<i>Trifolium</i>
PLANTAINS	<i>Plantago major</i>
MOSS	<i>Ceratodon purpureus and Bryum</i>

Mosses are non-flowering plants that have no root structure and rely on a sufficient moisture environment for reproduction and survival. Colonisation usually occurs during autumn and winter months when the soil surfaces are lying wet and saturated for long periods of time, particularly in the absence of any turf maintenance work. Mosses are not the cause of turf decline but a symptom of environmental conditions and/or poor maintenance regimes.

Moss can establish on weak and thin swards where there is a lack of competition from vigorous turf. A strong healthy turf is the best answer to moss prevention which can be achieved through good soil and grass management practices.

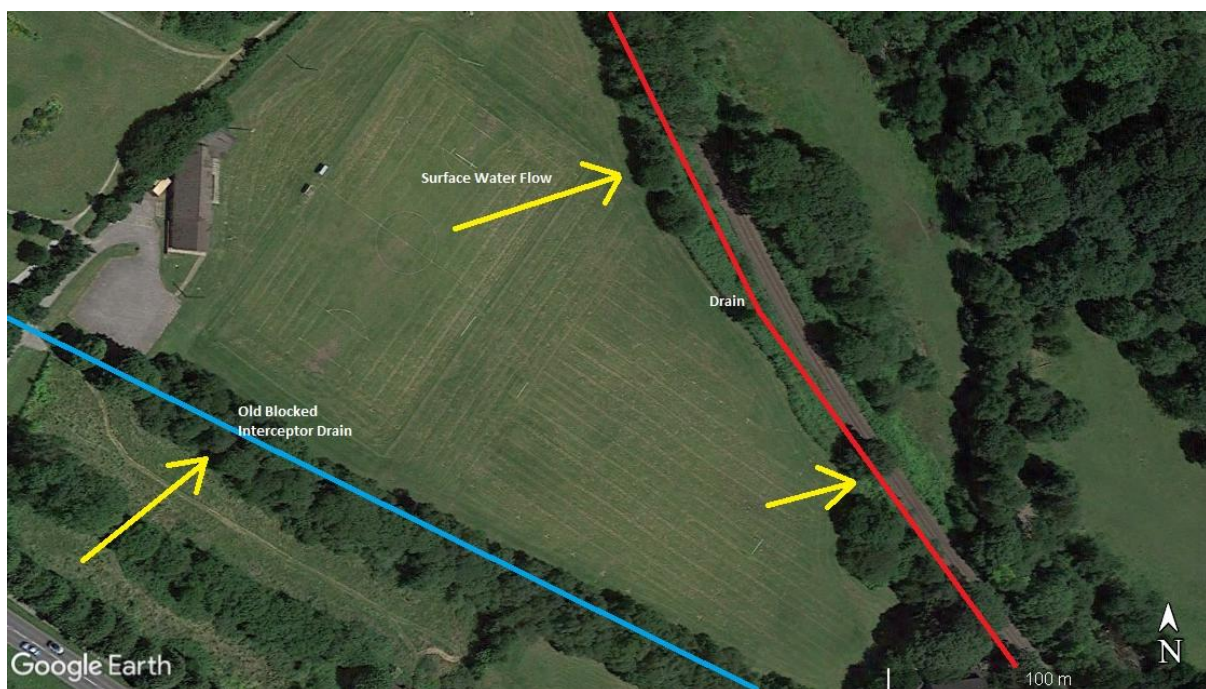
## Drainage

There is no evidence of any active drainage infrastructure on either of the pitches. The ground conditions display the characteristic features of a soil profile which is de-structured, has inherent low permeability and has no drainage capabilities and therefore is prone to saturated soil conditions and waterlogging.

There is an old drainage ditch/pipe which runs through the tree line along the south west boundary. This used to intercept surface water from the adjacent ground above but has since become blocked and overgrown. Consequently the surface water generated now runs directly onto the playing field and contributes to the overall wet conditions found on the ground.

The soccer pitch relies on surface water run-off to remove accumulated water. This water runs in a north east direction and is eventually discharged via a drain next to the railway line.

Similarly surface water from the rugby pitch runs towards the railway line to the east and discharges through the existing drain. This could be a useful outfall for any drainage system considered in the future.



**Figure 11 – Catchment Hydrology showing drainage and surface water flow**

### Other observations

- The dimensions of the soccer pitch as marked out on the day were approximately 60m wide and 100m long. The margins are approximately 2m to the surrounding railings in all directions.
- The rugby pitch is marked to approximately 60m by 90m (plus in goal areas).

## **6. Equipment & Maintenance**

There has been some occasional sand top dressing applications to the soccer pitch undertaken by the council but generally only basic and limited maintenance work is undertaken on these pitches include grass cutting, line marking and occasional light aeration operations.

**Pitch management practices are vital to fulfilling the designs true potential and inadequate maintenance operations will lead to poor surface performance and in turn not repay the capital invested in construction. A full maintenance programme should be provided with specifications for improvement works.**

## **Conclusions**

Both pitches show characteristics of surface drainage problems. The soccer pitch was reasonably dry and firm on the day of the visit however visual inspections of the surface highlighted areas of bare soil and poor grass health. Further investigations showed the upper soil profile to be compacted and de-structured which limit the infiltration of surface water through the profile and cause waterlogged surface conditions.

The rugby pitch had wetter surface conditions underfoot with some areas of surface ponding mainly towards the eastern boundary. The grass coverage was generally greater with a thicker sward.

The presence of Clay subsoil limits the vertical infiltration resulting in retention of soil moisture within the upper profile (topsoil) and hence saturated conditions after heavy rainfall events. The ground currently drains naturally as interflow (horizontal movement through the upper soil layer) to a limited degree with a reliance on surface water run-off after particularly heavy storms. Although not consistently waterlogged both pitches are subject to major disruption due to standing water and saturated ground conditions and often resulting in postponed matches.

The cross-field gradient of the soccer pitch is excessive and falls below the basic category for the PQS. An additional problem which is immediately noticeable is the undulating nature of the ground (the ground is not flat). This causes peculiar playing conditions and is outside the PQS.

The rugby pitch has a similar cross-filed slope which becomes more marked towards the eastern boundary and again falls below the basic category for the PQS. Some re-profiling of the ground to reduce the pitch slopes would improve this aspect of the PQS status.

Addressing the pitch drainage would dramatically improve play and increase the reliability of fixtures. It is also fundamental in promoting a healthy grass sward and an improved playing surface. Installation of a suitable drainage system and management of the upper soil profile would create a quality playing surface for both pitches.

## **8. Recommendations**

The surface gradient (slopes) should be reduced by re-profiling the ground and the movement of surface water through the profile should be improved by the installation of a comprehensive drainage system.

The soil chemistry status and grass plant health can be addressed during surface establishment and subsequent maintenance operations.

Having considered the information from the investigations I recommend the following processes to achieve the highest level of the PQS Standard.

### For both pitches

1. Re-profile to reduce the pitch gradients and the evenness of the surface
2. Install new drainage systems comprising of primary underdrainage pipework with secondary drainage sand grooving
3. Surface establishment of a suitable grass sward using a sports grass cultivar mix and improve the soil chemistry
4. Include an annual maintenance programme

**Improvement works will need a specialist sports pitch contractor to undertake the work. It is not a job for a civil engineering or groundworks contractor.**

### 9. Costings

The estimated capital costs for the recommended pitch improvement works are set out below. The figures are approximate and do not include VAT. A figure of 5% of the total cost should be added for any contingencies. Professional consultancy fees are not included.

#### Soccer Pitch

Item	Description	Estimated cost (£)
1	Re-grade surface by topsoil strip, grade subsoil, topsoil return	15 000
2	Supply and install pipe underdrainage system at 5m centres complete (1)	15 000
3	Install secondary drainage sand grooves	7 000
4	Surface establishment with sand top dressing, aeration, seeding and fertiliser	8 000
5	Annual maintenance (2)	6 000
	Total estimated cost	51 000

- (1) The primary drainage pipework may need to extend to a suitable outfall to the south east corner of the rugby pitch
- (2) Cost that would be expected to be incurred every year which would include some or all of the following operations in addition to the basic maintenance work such as grass cutting

Overseeding  
Aeration/de-compaction  
Fertiliser application(s)  
Weed control  
Sand topdressing

## Rugby Pitch

Item	Description	Estimated cost (£)
1	Re-grade surface by topsoil strip, grade subsoil, topsoil return	15 000
2	Supply and install pipe underdrainage system at 5m centres complete	13 000
3	Install secondary drainage sand grooves	7 000
4	Surface establishment with sand top dressing, aeration, seeding and fertiliser	8 000
5	Annual maintenance (2)	6 000
	Total estimated cost	49 000

## Project timing

Suitable ground conditions need to exist before any intrusive improvement works can be undertaken. This generally means commencement between early spring and late autumn when the ground is likely to be workable and grass establishment possible. Late summer or autumn sowing is preferable as there is likely to be better climate and soil moisture conditions for seed germination and grass establishment. There may be some constraints as to working on the fringes of the open season as this could disrupt the home fixture programme but this may be managed accordingly. Some operations would be weather dependent.

## Indicative works programme

Activity	Year 1	Year 2
Mobilisation	July/August	
Cut and fill re-grading operations	August	
Primary cultivations	August	
Install primary drains	August - September	
Final cultivations and sow grass	September	
Maintenance programme	October through to	September
Install sand grooves		April - May
Sand topdressing		April - September
Pitch ready for full play		August - September

## **10. Contact Details**

Please use the contact below if you have further questions about the contents of this report or for any other general enquiries.

Mr Peter Watkin Jones  
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## Appendices



## Soil sample results



ANALYTICAL REPORT										
Report Number	86591-20	W162	PETER JONES	Client	LLANGYNWYD PF					
Date Received	07-FEB-2020		OOLONG SPORTS		LLANGYNWYD					
Date Reported	14-FEB-2020		CARNFORTH		MAESTEG					
Project	SOIL		THE GREEN							
Reference	LLANGYNWYD P F		DENBIGH							
Order Number			DENBIGHSHIRE LL16 5TN							
Laboratory Reference		SOIL465148	SOIL465149							
Sample Reference		82 FOOTBALL	83 RUOBY							
Determinand	Unit	SOIL	SOIL							
pH water [1:2.5]		6.5	7.4							
Available Phosphorus (Index)	mg/l	15.0 (1)	21.2 (2)							
Available Potassium (Index)	mg/l	70.5 (1)	58.8 (0)							
Available Magnesium (Index)	mg/l	52.8 (2)	36.2 (1)							
Sand 2.00-0.063mm	% w/w	55	64							
Silt 0.063-0.002mm	% w/w	28	23							
Clay <0.002mm	% w/w	17	13							
Organic Matter LOI	% w/w	6.1	4.2							
Textural Class **		SL	SL							
<b>Notes</b>										
Analysis Notes      The sample submitted was of adequate size to complete all analysis requested. The results as reported relate only to the item(s) submitted for testing. The results are presented on a dry matter basis unless otherwise stipulated.										
Document Control <b>This test report shall not be reproduced, except in full, without the written approval of the laboratory.</b>										
Reported by      ** Please see the attached document for the definition of textural classes. <i>Myles Nicholson</i> Natural Resource Management, a trading division of Cawood Scientific Ltd. Coopers Bridge, Braziers Lane, Bracknell, Berkshire, RG42 6NS Tel: 01344 886338 Fax: 01344 890972 email: enquiries@nrm.uk.com										

## Performance Quality Standard Table (PQS)

### Performance Quality Standard Tables – Association Football

#### Structural Quality

Performance Standard	Method of Test	Quality Standard		
		High	Standard	Basic
<b>A. Herbage</b>				
i) Length of herbage: during the growing season	1	25 - 40 mm	25 - 50 mm	30 - 60 mm
during the non-growing season	1	20 - 40 mm	20 - 60 mm	20 - 70 mm
ii) Bare area.	3	≤ 10%	≤ 15%	≤ 25%
iii) Total ground cover	3	≥ 90%	≥ 85%	≥ 75%
iv) Desirable grass species	3	≥ 80%	≥ 70%	≥ 60%
v) <i>Poa annua</i>	3	≤ 10%	≤ 20%	≤ . 30%
vi) Other undesirable grass species	3	Nil	≤ 5%	≤ 10%
vii) Weeds - Large-leaved	3	Nil	≤ 2%	≤ 10%
viii) Weeds - Small-leaved	3	Nil	≤ 5%	≤ 5%
ix) Moss	3	Nil	Nil	Max. 2%
x) Algae and Lichen	3	Nil	Nil	Nil
<b>B. Pests and Diseases</b>				
i) Diseases	3	Nil	≤2%	≤2%
ii) Earthworms	3	≤1%	≤5%	≤10%
iii) Pests	3	Nil	Nil	≤2%
<b>C. Profile</b>				
i) Root depth	4	≥ 150 mm	≥100 mm	≥75 mm
ii) Thatch depth	4	≤5 mm	≤10 mm	≤15 mm
iii) Rootzone medium	4	≥ 200 mm	≥ 150 mm	≥ 100 mm
iv) Rootzone silt & clay content	14	≤ 6%	≤ 17%	≤ 25%
v) Infiltration rate	5	10 mm h <sup>-1</sup>	≥ 5 mm h <sup>-1</sup>	≥ 2 mm h <sup>-1</sup>
vi) Evenness: 2m straight edge, or 0.5m straight edge	2	± 15 mm ± 8 mm	± 18 mm ± 10 mm	± 25 mm ± 12 mm
vii) Soil pH	15	6.0 - 7.0	5.8 - 7.5	5.8 - 7.5
viii) Soil nutrient level: P <sub>2</sub> O <sub>5</sub>	11	Index 2	Index 2	Index 2
ix) Soil nutrient level: K <sub>2</sub> O	12	Index 2	Index 2	Index 2
x) Gradient: Length ways Across the pitch	16	> 1:200 1:150 - 1:100	1:200 - 1:100 1:100 - 1:80	1:100 - 1:80 1:80 - 1:50

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