

A Report to WYG

A Report into the Proposed Pitches at the Former East Lancashire Paper Mill - Radcliffe

21 July 2020



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Signed



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1.0 INTRODUCTION & OBJECTIVES

WYG are overseeing the conversion of the former East Lancashire Paper Mill Site into a new housing development and recreational areas. Part of the development includes relocating an existing cricket ground to within a new sports facility nearby.

The existing site is the former home of the East Lancashire Paper Mill which was closed in 2001, with the buildings demolished in 2006 and since then the site has been derelict. There are areas of the site which are within a flood plain therefore the levels, particularly on the cricket pitch, may need to be kept close to their current height to ensure that there are no issues with flooding of neighbouring properties or the new development.

The proposed sports pitch location is in the south east corner of the overall development, close to the remains of Radcliffe Tower which is a Grade 1 listed building. To the north east of the proposed area is Close Park which contains ornamental gardens, bowling greens and open recreational areas amongst other attractions. The overall site is approximately 23 hectares in size and is located to the south of Spring Lane, Radcliffe.

The site inspected is located at:

Land south of:
Church Street East,
Radcliffe,
Manchester,
M26 2RF



PSD were instructed by Mr. Christopher Bradshaw of WYG to assess the condition of the site for the proposed sports pitches to assess the feasibility of delivery the project including recommendations and budget costs for the project.

The original proposals required 2no football pitches to be installed in addition to the relocation of the cricket pitch, however following review the football pitches are no longer required and the facility created will be stand alone for cricket. A desktop review was carried out in July 2020 following a request from Homes England to alter the report as the football pitches included originally within the plans are no longer required. The original site survey was undertaken by Dale Frith of PSD on 30th May 2018.

2.0 EXECUTIVE SUMMARY

	1. Site access for deliveries & materials storage etc. is good.
	2. There is adequate area available to create the cricket pitch required to meet SE/NGB Guidelines.
	3. The cricket section should be able to take on maintenance of their area post-handover as per their current situation.
	4. The Club have the necessary equipment and expertise to maintain the pitches following the works but also intend to engage the services of a specialist contractor to undertake annual sand topdressing.
	5. The proposed orientation is within SE/NGB Guidelines of 305° and 55° for cricket.
	6. The gradient is currently within SE/NGB Guidelines however will be beneficial to improve the gradients as other substantial earthworks are required in the form of site clearance and topsoil importation.
	7. A maintenance period will be required prior to handover which should include sand dressings to further enhance the soil texture at the surface, fertiliser applications & Vertidrainage to the outfield and careful rolling and topdressing to the square.
	8. If winter usage is required on the outfield, a secondary drainage system will be required to assist water movement through the surface within the wetter winter months.
	9. Spoil arisings might need to go off site unless placement can be agreed with the Environment Agency.
	10. Restriction of working hours might be required due to the site being in a semi-residential location.
	11. The current surface and vegetation requires complete removal due to the poor quality of the vegetation and surface levels present.
	12. There is no existing drainage outfall present and as a drainage system is required, liaison with the Environment Agency will be required in order to establish connect to a positive outfall.
	13. The soil type and usage level dictate that a pipe drainage system is installed supplemented by sand topdressing.
	14. The site is identified as being within flood zones 2 & 3. This will require liaison with the Environment Agency to determine actions required. It is likely that the existing levels can't be altered.
	15. Appropriate management of site access and pedestrians/dog walkers using the playing field will be necessary during any works.

KEY: No action required Action may be required Action required

The installation of a drainage system and improvement of the soil texture are fundamental requirements for the short and long term success of the pitch. Therefore, the following items are required:

- Removal of existing vegetation and disposal off site
- Importation/transfer of topsoil material and placement
- Installation of lateral drains @ 5m centres
- Drainage arisings disposal onsite
- Connection to a positive drainage outfall
- Sand amelioration on outfield (25mm layer)
- Post installation vertidrainage and sand dressings – 2 no.
- Cricket square comprising allowance for 350mm construction depth, sitting 25mm above the level of the surrounding outfield levels and comprising of 100mm 2-6mm gravel layer, 150mm of specified and approved rootzone and topped with 100mm approved cricket loam played in layers not more than 50mm depth and keyed into the sub-base material.
- Installation of a water supply – it is imperative that a working water supply is installed adjacent to the cricket square to allow for safe preparation of the cricket square for use. In the absence of water, cricket square performance can be dangerous. The water supply must be a WRAS Category 5 compliant irrigation system.
- Install ball stop fencing to agreed location subject to ball strike assessment

Note:

- The costed options below are based on a cricket outfield of 13,548m² and the construction of a new cricket square on a like for like basis in terms of size with the existing square (12 wickets) – 736m².
- The costs indicated include items for removal of the existing vegetation and spreading of site won topsoil.
- The work costs include a 5% contingency.

In terms of budget costs, the following is anticipated:

WYG - East Lancs Paper Mill			
Sports Pitch Construction - 13,548m²			
Item 1	Prelims	£	12,705.00
Item 2	Earthworks	£	51,344.48
Item 3	Land drainage (including connection to a positive outfall)	£	56,027.84
Item 4	Sand amelioration, final prep & seed	£	30,085.95
Item 5	Vertidrainage and Topdressing	£	20,924.46
Item 6	Sward establishment and maintenance	£	16,598.91
Item 7	Cricket Square Construction (pipe & square connection point only - no external connections included)	£	49,995.00

Subtotal	£	237,681.64
5% contingency	£	11,884.08
Total ex. VAT	£	249,565.72
VAT @ 20%	£	49,913.14
<u>TOTAL inc. VAT</u>	<u>£</u>	<u>299,478.87</u>

Consultancy fees for design and tender and contract administration have not been included and will need to be added to the project costs. Costs for ball stop netting have not be included as this is subject to a ball strike assessment if applicable. Ball stop netting costs for 100m length are approximately £10,000.00.

Based on the findings on site, the location and proposed usage, the works costed should be carried out as a minimum. Annual maintenance including sand dressings, fertiliser applications and vertidrainage are essential practices to be carried out. Additionally, scarifying to remove dead vegetation and overseeding would provide benefits to the health of the sward.

PSD have considered the requirement to include secondary drainage to the whole of the cricket outfield should it be used for winter sports, excavated slit drains at 1m centres will be recommended to form a Sport England Type 5 pitch. Budget costs for this are in the region of £32,000. There is potential to install the slits at 2m centres over the outfield area which would cost half of the amount at approximately £16,000.

3.0 SUMMARY OF FINDINGS

3.1 Proposed Layout/Orientation



The proposed layout comprises of a cricket pavilion, square and outfield as shown in Plate 1. The proposed sizes will need to meet those summarised in the table below to meet Sport England Guidelines.

Plate 1: Proposed Site Layout

There is an access track along the western elevation, and it is imperative that a safety margin of 2.74m around the perimeter should be allowed for in any proposed layout in order to meet current ECB guidelines. Due to the proximity of the access track, it is recommended that a ball strike assessment is carried out to check for the requirement for fencing and/or ball stop netting.

WYG - East Lancs Paper Mill						
Proposed Pitch Size Assessment						
Pitch	Proposed Age Group	NGB Recommended Sizes				Comments
		Square Size		Overall Area		
		Length	Width	Length	Width	
Cricket	Open Age	20.12	36.6	111.56	128.04	Pitch to meet NGB Recommended Size

Table 1: Pitch Sizes and Run-offs

The newly installed pitch should be installed to NGB recommended sizes, the size of the outfield should be checked so that it complies with ECB guidelines of a minimum boundary 45.72m (50 yards) measured from the centre stump.

The table above gives the overall sizes for the pitch indicated and these can be accommodated within the area available. There is an option for winter sport usage of some of the cricket outfield which is becoming common practice.

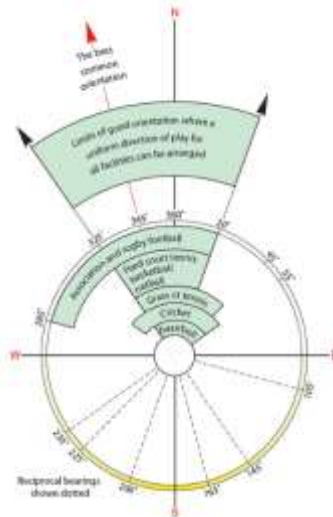


Fig 1: SE/NGB recommended orientation for a range of sports

In terms of orientation the cricket wicket is expected to be generally in a north to south direction and it will therefore be within the recommended range of 305° and 55°.

3.2 Existing Gradients/Surface Levels

Based on information provided in the form of 0.5m Lidar Contour plan, dated September 2017, approximate gradients are shown. Based on the site survey and the information provided approximate gradients are shown in the table below. The data provided indicates that the pitches would fall within the recommended gradients for pitches to current SE/NGB guidelines.

WYG - East Lancs Paper Mill				
Sport England/National Governing Body Preferred Gradients				
Pitch #	SE/NGB Preferred %		Measured on Site %	
	Line of Play	Across Play	Line of Play	Across Play
Square	Max 1%	<1.67%	2.00	0.25
Outfield	<2.0%	<2.0%	2.00	0.25

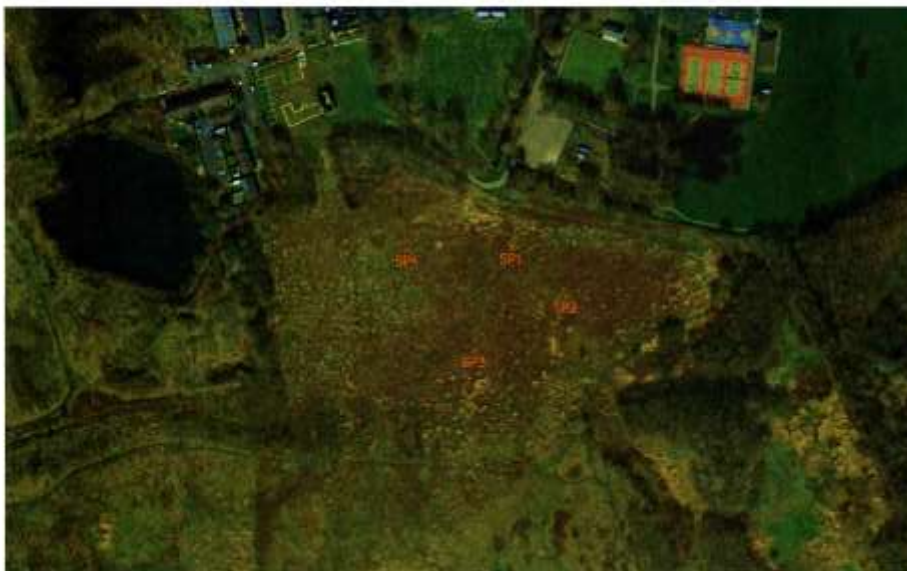
Table 2: Pitch Gradients

As part of the full design of the scheme, the levels of the pitch would need to be set to ensure that it is within SE/NGB guidelines. The current site has gradients just within the guidelines, there are however numerous low areas and discrepancies in the surface. This combined with an excessive amount of vegetation present on site will require significant work and presents the opportunity to allow the ground to be smoothed out as part of this process. It is also envisaged that a significant amount of topsoil will be required to improve the quality and depth of soil within the area. This should be possible by re-using topsoil from other areas of the development, e.g. pavilion, car park etc. Any changes in the existing levels or gradients would need to be agreed with the Environment Agency as the site is located within Flood Risk Zones 2 and 3.

Design levels should ideally be no more than 1% in either direction, this allows for the square and outfield to be installed on the same plane which is better for both play and maintenance.

3.3 Soil Profile

East Lancashire Paper Mill Site
Location of Soil Profile



Excavations with a spade and hand-held auger together with laboratory analysis of the soil indicated the following:

a) Topsoil

- Maximum 150mm depth of topsoil, reasonably well structured; contained a significant amount of stones with laboratory analysis confirming 23.4% of material is over 3.4mm which is classed as a coarse gravel.
- A 40-50mm layer of fibrous organic material was present at the immediate surface of the topsoil. This was combined with the presence of a thick moss layer and a high amount of rooting mass at the surface.
- Laboratory analysis (see Appendix 2) classified the topsoil as a loam which after removal of the gravel, contained 49.8% sand, 31.2% silt and 19.0% clay.

Sample	% Gravel	After removal of gravel			Soil Texture Classification
		% Sand	% Silt	% Clay	
Sample EC/1/10804	26.1	49.8	31.2	19.0	Loam

In terms of the physical analysis of the topsoil, although it contains a relatively high percentage of sand with overall percentage 49.8%, the fines content of the remaining 50.2% below 0.125mm will determine that it behaves as a fine textured topsoil and will be susceptible to structural damage (compaction) during play in wet conditions.

To improve the soil texture, sand amelioration will be required during the winter sports pitch and outfield installation phase. This will allow a large percentage of the upper profile of topsoil to be

enhanced. Further sand dressings are recommended on an annual basis to ensure continual improvements are made along with ensuring that the surface to drain connection remains open and functional.

Chemical analysis of the topsoil recorded a pH of 7.9 which is above the preferred range of 6.0 to 7.0 for a perennial ryegrass dominant sward.

Levels of major nutrients (phosphorus, potassium and magnesium) were recorded as Index 0.7 for phosphorus, 1.7 for potassium and 2.9 for magnesium.

Analysis	Result	Guideline	Interpretation	Comments
pH	7.9	6.0	High	High. An alkaline environment will reduce the availability of certain nutrients - particularly P, K, B, Co, Cu, Fe, Mn and Zn. An elevated pH will also impact on beneficial soil fungal populations and activity.
Phosphorus (ppm)	7	16	Very Low	(Index 0.7) 120 kg/ha P2O5 (96 units/acre).
Potassium (ppm)	107	121	Low	(Index 1.7) 80 kg/ha K2O (64 units/acre).
Magnesium (ppm)	98	51	Normal	(Index 2.9) Apply 25 kg/ha MgO (20 units/acre) every three to four years.

With the recommended index range being 2.0 to 4.0, it can be seen that the topsoil is very low in phosphorus, low in potassium but has normal levels for magnesium.

Based on the results, an annual fertiliser programme which provides in the region of 100-120kg of Nitrogen per hectare and includes phosphorus and potassium would be recommended. Depending on budget restrictions, the use of controlled release or possibly organic based fertiliser would help to prevent flushes of growth which results in the grass being soft and needing to be cut more frequently. The pH of the soil will cause some elements to be locked up and unavailable for plant growth. A fertiliser regime will generally reduce the pH of the soil over time.

b) Subsoil

The subsoil was found to be a clay material immediately below the topsoil level. The subsoil contained a minimal amount of stone but was a massive clay structure throughout.



Plate 2: Typical topsoil profile and condition



Plate 3: Typical top of subsoil showing dense clay of very low permeability

3.4 Climatic Data

A collation of historical climatic data is tabulated in Table 4

Characteristic	Data	Comments
Annual rainfall	1,133mm	All represent high readings
Excess winter rain (median)	600mm	
Excess winter rain (quartile range)	460-720mm	
Return to field capacity	11 September	The pitches will be at field capacity for the majority of the football season
End of field capacity	13 May	
Period of field capacity	245 days	
Growing season	2 April- 26 Nov (238 days)	Reasonably long growing season; little need for irrigation
Grass drought factor	<5 days	
Potential transpiration	442mm	

Table 3: Historical Climate Data

From the table above, the following should be noted:

- Average rainfall for the area is high at 1133mm per year
- The median excess winter rainfall which is the amount of rainfall that needs to be discharged through the profile and the drainage system over the winter period is recorded as 600mm (excess winter rain does vary from year to year and the quartile range given is 460-720mm).
- Field capacity is that state in which the soil is holding maximum amount of water after free drainage has ceased. It is useful to know this since it indicates the time of year about which drainage will start to occur and also that time when soil compaction is most likely to happen. Fine textured soils in particular are susceptible to compaction from physical forces when at field capacity or above. The median date for return to field capacity is 11 September for this area and the end of capacity given as 13 May. This equates to the topsoil being at field capacity for 245 days and the majority of the winter sport season.
- The grass drought factor gives an indication of the number of days when the soil moisture deficit exceeds 50mm within the main rootzone. Such a soil moisture deficit is likely to lead to the growth of grass being impeded due to a lack of regularly available soil moisture. In this area the grass drought factor is estimated to be under 5 days.
- The determination of the growing season is not easy as it depends upon a number of different factors. However, in this case it is defined as the length of time that the top 300mm of soil remains above 6°C. For this site the growing season is said to be 238 days (2 April – 26 November) and will provide a significant recovery period between seasons, assuming that the pitches are not excessively used for summer activities/usage.

In summary, excess winter rainfall is high and will need to be removed by an efficient drainage system given the presence of the impermeable clay subsoil. Should winter sport usage be required, deterioration of the topsoil structural condition especially at the surface, would be expected given it would be at field capacity for much of the period these sports are played. Supplementing the pipe drainage system with sand slits to bypass the deteriorated topsoil must be considered as an essential component of the works on all areas to be used for winter sports should this be applicable.

The need to irrigate to enable the sward to recover following renovations at the end of the soccer season in spring is assessed as not being essential but useful according to historical weather data. Nevertheless, a late summer sowing would be preferred for establishment of the area.

3.5 Existing Drainage

The existing condition of the area shows no signs of any existing drainage to be present. This can be attributed to the vegetation seen within the site and factors on the surface of the topsoil suggesting that water either stays within the soil for long periods or runs off the surface of the adjoining higher ground towards the lower ground to the north. There are no potential outfall chambers within the area however there are some sealed chambers to the north of the site just outside of its boundary. Also, nearby is a stream known as locally as Bealey's Goit which runs from the north of the site and culverted underneath the proposed pitch area. It is assumed that the Goit will run in a southerly direction and link in with the River Irwell which runs generally to the south of the overall site.



Plate 4: The end of Bealey's Goit near the proposed pitch area, note the start of the culverted section



Plate 5: Bealey's Goit looking north away from the area



Plate 6: Sealed chambers located just outside the perimeter of the site. It is unknown what is contained inside.

A new drainage system will be required to within the sports pitches allowing for climatic factors and usage levels. It is understood that a swale is to be created to the north of the cricket pitch into which the drainage system can be connected, the swale is proposed to be connected into Bealey's Goit. This arrangement will require permission from the Environment Agency. Consideration will also be required to prevent water from the higher area to the south of the site affecting the playing area and site in general.

3.6 Agronomic Assessment

The existing vegetation was overgrown significantly with the vegetation consisting mainly of reeds and other marsh loving vegetation. The ground was firm underfoot which can be attributed to the timing of the visit following a period of dry weather. There are a large number of small trees and

bushes present within the area and there is a high level of moss and other fibrous vegetation present within the surface of the soil. There is also a high number of weed species such as mare's tail present with minimal sports turf grasses present.



Plate 7: General view of the existing vegetation



Plate 8: Typical weed content present

3.7 Pitch Usage

Usage will follow the needs of the East Lancashire Papermill Cricket Club. It is envisaged that their usage will be similar to what it is currently which is a maximum of 2-3 games for week during the cricket season (April-September).

The current layout plan provides a square of width 36.6m which is capable of accommodating 12no. pitches. In terms of projected usage, typically each pitch will accommodate 3 no. adult games plus 2 no. junior games. Therefore, the capacity of a 12-pitch square would be:

$12 \times 3 = \underline{36 \text{ adult games}}$ and $12 \times 2 = \underline{24 \text{ junior games.}}$

Assuming a typical adult league season comprises 22 fixtures, the new square should be capable of hosting 2 adult teams with 1 game some weekends, 2 games on other weekends with the capacity to host a further 24 junior games which is generally adequate.

Alternatively, provision of a non-turf pitch to cater for younger age-group cricket would increase the availability of the natural turf pitches for older juniors and/or increase potential for training.

It is important that the client on behalf of the club are fully aware of the likely number of fixtures per season in order to determine the size of the proposed cricket square and overall ground dimensions as this could affect a number of important factors.

Should winter sport use be considered within the outfield, Sport England consider the information provided in Table 4 as giving a reasonable estimation of the likely usage level on winter sports pitches for a range of construction types.

Drainage status	Adult weekly use* (hours)
Undrained	Under 2
Pipe-drained	2 – 3
Pipe-drained with mole drains	2 – 4
Pipe-drained with sand grooves	3 – 6
Pipe-drained with slit drains	3 – 6
Pipe-drained with topsoil and drainage layer	3 – 6
Pipe and slit drained	3 – 6
Pipe-drained with suspended water table	4 – 6

*The usage levels shown will increase by ~50 % for players 15 years of age and under.

Table 4. Estimated usage levels

Given the particle size distribution of the topsoil and the low permeability of the subsoil, the minimum improvement works required to install the cricket pitch, a pipe drain installation supplemented by sand amelioration and sand dressings is required. Should winter sports usage be required, there is the option to install slit drains and/or sand grooves in the future. The sand amelioration and dressings help to improve the physical characteristics of the topsoil including the more rapid transmission of water to, and the protection of, the supplementary drainage system. The amount of sand dressing required will be determined at the design stage once an assessment of the proposed material has been fully carried out.

Overall, an initial approach of installing a system with lateral drainage will be sufficient for the use of the cricket club if adequate maintenance practices are followed, this includes regular aeration and annual sand dressings to maintain a passage between the surface and the drainage system below.

If winter sports usage is required a surface by-pass drainage system would be required in combination with the pipe drains, with this installed it is expected that pitch usage of 3 – 6 hours per week for adults or 4½ - 9 hours per week for younger age groups would be sustainable based on SE's estimates.

3.8 Site Infrastructure and Influencing Factors

A summary of relevant information relating to the site is given below:

- Access for articulated lorry deliveries and machinery for initial site clearance prior to the full design stage should not be an issue with all other associated works to be carried out within the development and will need to be accounted for.
- A suitable area will need to be made available for a site compound/materials storage area and needs to include sufficient room for stripped topsoil to be stockpiled locally during cut/fill earthworks and drainage/construction material stockpiles which will be significant.
- It is anticipated that drainage arisings can be disposed of on site, however this should be confirmed as part of the design stage.
- The location of residential dwellings to the north east of the proposed area could restrict working hours on site.
- The site is currently open in terms of access for pedestrians/dog walkers and will require appropriate management during any works.
- Provision of a suitable water supply and irrigation system will need to be included to construct and maintain the cricket square. The water supply must be WRAS Category 5 compliant irrigation system.
- A ball strike assessment is recommended to determine whether ball stop netting is required to prevent potential damage to adjoining property or people accessing the site.

- Based on current Local Authority data, the site is within Flood Zone 2 and 3 which represents a high risk of flooding.



Fig. 2: Flood map showing the site falls in Zones 2 & 3



Plate 9: Work area, site access & materials storage

4.0 RECOMMENDATIONS & BUDGET COSTS

4.1 Recommendations

The site requires a heavy clean-up of existing vegetation/trees/scrub and removal of stones along with the installation of a new piped and slit drainage system as a minimum. Improvement of the gradients whilst cleaning the site and replacing the topsoil would be beneficial. Being in an area of high rainfall and having a fine textured topsoil overlaying a dense clay subsoil of low permeability there are limited options for this site. Sand amelioration of the topsoil would be beneficial to improve the soils' physical characteristics and drainage properties. This works would establish a Sport England Winter Sports Type 2 Pitch which can be made into a Type 5 Pitch for Winter Sports use if excavated slits are installed.

The overall works should comprise of the following:

- Review of pitch size to be provided and that this is adequate compared to the existing provision whilst being in accordance with NGB/SE guidelines.
- Ensure that there is a positive outlet for a drainage system which is essential for the success of any pitch development within the site. This will require agreement from the Environment Agency.
- The existing vegetation will need to be cleared and ensure that the root mass is also removed. This material will need to be fully removed from site as it is of no value to the development of the pitches.
- Carry out a cut and fill exercise to create suitable gradients according to the design, maximum gradients of 1% in each direction are recommended.
- Any existing topsoil remaining will need to be thoroughly cleared of stone content and any other contamination.
- Topsoil will need to be imported onto the area to ensure that there is a minimum of 150mm of topsoil present but ideally 200mm present in all areas. The topsoil should be sand ameliorated to improve its physical and drainage characteristics.

- A different approach will be required to the cricket square area where all material will need to be imported including a gravel drainage layer and loam.
- A drainage system in the form of laterals installed at 5m centres will be required and will need to connect to a positive outfall. Should secondary drainage be required for winter sports usage, the installation of excavated slit drains at 1m or 2m spacings (depending upon usage levels and types) will be required, these will need to be installed into an established sward and can be installed in future years if the demands on the site change.
- Disposal of drainage arisings may be possible on site however, the material will be of poor quality and placement will need to be considered in relation to EA stipulations re flood defence and flood zone risk.
- Install ball stop fencing to agreed location subject to ball strike assessment.
- The sward will need to be established by seed and a careful maintenance plan implemented by a specialist contractor for at least 12 months after Practical Completion. Should the excavated slit drainage option be used, they require installation into an established sward, therefore a secondary establishment is required within the overall 12-month period.
- Annual sand dressings, vertidrainage and fertilising operations as well as overseeding should be carried out on an annual basis to ensure that the outfield remains usable for the future, if no maintenance is carried out, the surface can hold onto additional organic material (thatch) which slows percolation rates through the surface. This can lead to the area holding water and cause games to be called off following rainfall.
- Post works, producing a safe playable surface is essential for cricket. This will only be achieved by implementing appropriate maintenance of the cricket square and outfield. A newly constructed cricket square normally takes 12-18 months before it is safe to be brought into use. 12 months establishment and maintenance by the specialist contractor must be allowed for.

Note: The end of season sand topdressing/vertidrainage/overseeding works/overseeding works should be undertaken by experienced specialist sportsground contractor.

4.2 Guideline Costs

The installation of a drainage system and improvement of the soil texture are fundamental requirements for the short and long term success of the pitch. Therefore, the following items are required:

- Removal of existing vegetation and disposal off site
- Importation/transfer of topsoil material and placement
- Installation of lateral drains @ 5m centres
- Drainage arisings disposal onsite
- Connection to a positive drainage outfall
- Sand amelioration on outfield (25mm layer)
- Post installation vertidrainage and sand dressings – 2 no.
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- Installation of a water supply – it is imperative that a working water supply is installed adjacent to the cricket square to allow for safe preparation of the cricket square for use. In the absence of water, cricket square performance can be dangerous. The water supply must be a WRAS Category 5 compliant irrigation system.
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Based on the findings on site, the location and proposed usage, the works costed should be carried out as a minimum. Annual maintenance including sand dressings, fertiliser applications and vertidrainage are essential practices to be carried out. Additionally, scarifying to remove dead vegetation and overseeding would provide benefits to the health of the sward.

Should there be a change in usage in future to include the playing of Winter Sports, there will be a requirement to install secondary drainage with excavated slit drains recommended. The spacings of the slit drains would be determined depending upon usage levels and types and would probably be either at 1m or 2m spacings.

5.0 TIMESCALES/INDICATIVE PROGRAMME

With respect to timescales for completing the project, it is recommended that construction works are only undertaken under suitable ground and weather conditions and ideally achieve seeding in late August. If the excavated slit drainage option is installed, the slit drains can be installed the following Spring once ground conditions permit and this will allow sufficient time to establish the surface ready for use in the September.

A cricket square requires a period of at least 12 – 18 months establishment post construction to allow for any settlement and topdressing etc. to ensure it is ready for use.

An indicative work programme is presented below and includes excavated slit installation for indicative purposes, if the slit drains are not required at this stage, the initial seeding would be followed by a 12-month maintenance period. Ideally a late Summer seeding date is preferable and would negate any requirement for additional irrigation to aid establishment.

Possible Timescale – Drains @ 5m centres and excavated slits @ 1m centres

Sportsfield Drainage Works	Year 1										Year 2							
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S
Design																		
Tender																		
Mobilisation of contractor																		
Site Clearance																		
Topsoil Import																		
Piped Drainage																		
Initial Seeding																		
Sand Slits																		
Overseeding																		
Initial Maintenance																		
Pitch Brought Into Use																		

*P denotes "Possible"

6.0 CONFIDENTIALITY

This presentation is confidential and is only for the use of officers of WYG. Without the specific consent in writing of Professional Sportsturf Design (NW) Ltd, no copies of this presentation are to be made and information contained herein should not be communicated to any third party. At the request of Professional Sportsturf Design (NW) Ltd all copies of this document, in whatever form, are to be returned.

7.0 ADDITIONAL INFORMATION

It is the client's responsibility to check with the relevant local authority regarding permissions to implement the works e.g. planning permission or any other factors that could affect starting on site or progress whilst on site.

A Performance Quality Standards assessment (PQS) is provided in Appendix 3 which provides valuable data to compare the condition of the pitches post improvement.

This report does not constitute a detailed Specification or Bill of Quantities, and as such, is not suitable for use in obtaining prices from contractors or as a formal construction contract document.

Successful implementation of the works on the natural turf facilities at the Former East Lancs Paper Mill should involve the preparation of a full design and specification and the skilled implementation of the designed works. It must be appreciated that the preparation of good sports turf surfaces involves a great deal of skill and care. Materials, particularly soils on site, are variable. The way in which the works are implemented and especially the weather and ground conditions prevailing at the time are as important as the methods used.

Any work would best be carried out during the normally drier months of late spring and summer, with an aim to grow in the pitch ready for use in late summer to early autumn – depending on the weather.

Following the construction works it is essential that the facilities should be properly maintained, receiving a full maintenance programme designed around the individual requirements of the site.

All relevant Health and Safety Regulations must be observed and the works, as more widely described, would not fall within the scope of the Construction (Design & Management) Regulations 2015 (CDM 2015).

8.0 CONTACT DETAILS

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APPENDIX 1

WYG – Lancashire Paper Mill

PROPOSED LAYOUT



APPENDIX 2

WYG – Lancashire Paper Mill

SOIL ANALYSIS RESULTS

Analysis Results (SOIL)

Customer	1SOL	Distributor	P.S.D. (NW) LTD WIGAN ROAD LEYLAND LANCS PR25 5XW
Sample Ref	EL/2/10805	Date Received	05/06/2018
Sample No	E265879/01		
Crop	GRASS GROWTH		

Analysis	Result	Guideline	Interpretation	Comments
pH	7.9	6.0	High	High. An alkaline environment will reduce the availability of certain nutrients - particularly P, K, B, Co, Cu, Fe, Mn and Zn. An elevated pH will also impact on beneficial soil fungal populations and activity.
Phosphorus (ppm)	7	16	Very Low	(Index 0.7) 120 kg/ha P ₂ O ₅ (96 units/acre).
Potassium (ppm)	107	121	Low	(Index 1.7) 80 kg/ha K ₂ O (64 units/acre).
Magnesium (ppm)	98	51	Normal	(Index 2.9) Apply 25 kg/ha MgO (20 units/acre) every three to four years.

Additional Comments

The analyses and interpretations for P & K have been carried out in accordance with RB209. PLEASE NOTE: The recommendations should be adjusted if organic manures are used. See RB209 for more information.
Additional technical bulletins are available at www.lancrop.com

Please Note

Whilst every care is taken to ensure that the Results from Analysis are as accurate as possible, it is important to note that the analysis relates to the sample received by the laboratory, and is representative only of that sample. No warranty is given by the laboratory that the Results from Analysis relates to any part of a field or growing area not covered by the sample received. It is important to ensure that any soil, leaf, silage or fruit/seed sample sent for analysis is representative of the area requiring analysis and that samples are obtained in accordance with established sampling techniques. A leaflet containing instructions on how to take soil, leaf, herbage, silage and fruit samples for analysis is available from the laboratory on request.

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Date Printed : 06/06/2018

APPENDIX 3

WYG – Lancashire Paper Mill

PQS ASSESSMENT

Appendix 3: Performance Quality Standards

Client: WYG – East Lancs Paper Mill

Physical Site Survey date: 30th May 2018

Project Title: Sports Pitch Improvements – 3no. Soccer Pitches

ELEMENT	LIMITS	METHOD OF TEST	Visit 1	Visit 2
Ground cover %	>75%	BS 7370 : P3 A6	✗	
Broad-leaved weeds %	<10	BS 7370 : P3 A6	✗	
Sward height mm	20-70 PS 30-60 CS	BS 7370 : P3 A3	✗	
Thatch depth mm	<15	BS 7370 : P3 A7	✗	
Hardness in g	35-200	STRI method of test using a 0.5 kg Clegg Impact Hammer from a drop height of 0.55 m	n/a	
Water infiltration rate mm d ⁻¹	5 (mm/hr)	BS 7370 : P3 A8	✗	
Evenness (2 metre straight edge)	<25 mm	BS 7370 : P3 A6	✗	
Slope: Direction of play (%)	<1.00 - 1.25	BS 7370 : P3 A5	✓	
Across play (%)	<1.25 - 2.5%		✓	
pH value	5.8 – 7.5	ISO 10390	✗	

KEY: SH = Sward Height PS = Playing Season CS = Closed Season

Visual assessment is an acceptable alternative method of testing, if undertaken by a turfgrass consultant who is able to satisfy the selection criteria identified within the Turfgrass Consultants – Construction/Upgrade Brief.

Assessment undertaken by: Dale Frith

Consultancy: Professional Sportsturf Design (NW) Ltd

APPENDIX 4

WYG – Lancashire Paper Mill

MAINTENANCE GUIDELINES

Outline Maintenance Recommendations – New Cricket Squares

Background: New cricket squares traditionally take at least 12 months before they can be used for the first time. However, sometimes it is necessary to construct a square at the end of one season and use it in the next season. Either way, the square requires careful management to ensure three key performance factors going forward:

- Good, even grass cover that is well rooted into the profile and clean of weed.
- A smooth surface that will give consistent ball bounce
- A gradual increase in compaction of the square (or pitch) over time.

New squares are generally low, slow and slightly variable in consistency in their first year but quality improves in years 2 and 3 and reaches optimum in years 3 to 4, provided that good maintenance is carried out.

There are some golden rules to follow however:

- Stay off the square until it is dry enough to walk on.
- Never take a mower on to the square that is going to cause a rut or scour as it is wheeled or turned.
- Never roll a new square when it is wet or saturated.
- Always remove clippings and empty the mower box before it becomes overfull and sinks the mower.
- Do not use disc seeders or deep scarifiers in very young squares.

If in doubt, keep off and deal with it when it is dry. New squares should not be rushed timing is everything – get it right and you will have a good square. Get it wrong and you can cause significant problems and thousands of pounds of damage.

Mowing. Try to maintain the grass at 20 mm initially to help maintain sward density. It is difficult when a square has been constructed at the end of the season going into a wet autumn-winter period. The purpose of the cutting is to help encourage tillering and a good sward density but it is better to leave it to grow in moist conditions (it will slow down in the cold of the winter anyway) than it is to try and mow it when wet and damage the surface levels with the mower. You can always overseed in the spring to help with grass cover so do not panic.

The ideal machine for cutting the grass early on is a rotary mower equipped with a rear roller and wide front wheels – this helps to reduce rutting. Initially aim for 20-25 mm and look to cut to 20 mm going into winter. Cut when you can but don't walk on the square when frosty to cut.

As you come into late February March bring the cut height down gradually to 20 mm and then 18 mm and then look to maintain the square at about 15 mm. Do not go too short too soon or you will affect root growth. If the grass does become too long, the height of cut should be reduced gradually over 3 – 4 cuts allowing some time for recovery in between. **N.B.** On no account should the grass height be reduced by more than 50% on any one occasion.

Fertiliser application. New squares are hungry because the root system is immature. Allowance should be made for a sufficient number of fertiliser applications to maintain healthy growth and colour (typically 3-4 per annum). The fertiliser regime should be based on the results of annual soil sampling to determine nutrient concentrations, but the following programme is provided as a guide:

- April 12:6:6 at 350 kg/ha
- May/June Liquid application of micro nutrients and micro-stimulants with fertiliser
- June/July 12:6:6 at 350 kg/ha
- September 5:5:20 at 350 kg/ha

Fertiliser shall be applied with pedestrian disc spreaders across the direction of play and then in the direction of play to ensure a uniform distribution.

Weed control. Squares are often small enough to hand weed – when the square is dry, use a flat bladed screw driver to lift weeds and their roots – do not leave tap roots in the soil or the weed can come back. Fill the hole with a mix of loam and grass seed and brush to surface level. If necessary (weeds are wide spread or creeping), apply a selective herbicide in the spring (if required). This to be applied at least two weeks after the first fertiliser treatment (April) and at a time when grass growth is strong and healthy. **NB.** Do not apply herbicide during periods of potential turf stress, i.e. if the weather is hot and dry or if frosts are forecast. Apply herbicide strictly according to the manufacturers label recommendations and only by suitably qualified

personnel. Use pedestrian machinery – do not use tractor mounted sprayers – there is a risk of damage to surface levels.

Rolling: If constructed properly, new squares will be dense as they should be compacted in layers as they are built up. The Cranfield University Rolling Trials showed that a roller is only effective to about 75 mm depth in the profile so they must be compacted as they are built. However, this does not mean that they should be rolled with the heavy roller as soon as possible. The same trials showed that grass roots play an essential role in preventing rollers from bulldozing the soil forwards which will ruin levels.

If your square was constructed in June/July you might be able to compact the square with cylinder mowers but avoid using the roller if possible. You will then be able to pre-season roll as before in March/April as per the Cranfield University Rolling Guidelines – start with heavy mowers and build up as ground conditions allow.

If your square was constructed in September / October leave rolling until April in the following year – let the grass establish a strong root network over winter and allow the soil to dry in early Spring. Depending on when you need to use the square the weight of roller can be increased gradually.

Never roll when the soil is soft – it must be able to take a cylinder mower without creasing before a roller is used. If you roll when it is too soft or wet you will corrugate the surface of your new square.

Aeration: New squares will not need to be spiked if they are well constructed and well cared for. Any spiking should only be done following analysis of soil cores by an experienced consultant or ECB Pitch Advisor.

Never use a slit tine aerator on a cricket square as you will encourage cracking and do not use hollow tines as this will result in an uneven surface.

Overseeding: Squares should be overseed at least twice before first use to help encourage good coverage. Only seed on a slight diagonal (stumps to the stumps on 1-2 pitches over) or in the line of play – do not overseed across play. Only use a dimple seeder – do not use a disc seeder as this will encourage cracking. Use a specialist dwarf perennial ryegrass cricket seed mix.

Loam topdressing: Because of the soft nature of the surface when cricket squares are constructed, achieving smooth levels straight away is very difficult and it can take 2-3 seasons of heavy cricket loam topdressing.

Always topdress with the loam used to construct the square. Dressings at the end of the first two seasons following construction should be made using 8-10 25 kg bags per pitch and along the full length of the pitch – do not just dress the ends. Following application of the loam (ideally using a drop spreader or something like a Sisis Truspred), a lute or straight edge should be used to work the loam into the profile and achieve a smooth finish.

Verticutting: Dwarf perennial ryegrasses do not tend to have a lot of lateral growth so verticutting is only required if there is a high content of *Poa annua* (annual meadowgrass in the sward) – verticutting will help maintain a higher shoot density and plant density if that is the case. Verticut with care as this will stress the grass plant – look to cut to about 1 mm above the surface and try not to cut into the surface or scarify the square.

Pesticide/Fungicide [If required]: A pesticide/fungicide application may be required should disease be present within the grass sward. An approved fungicide should be used with activity against the pathogens present and be applied following the manufacturers label recommendations by suitably qualified personnel.

Summary:

- The key to maintaining a new square is patience and not to panic – if you think it is too wet to put machinery on – it probably is – so keep off it. There will be a dry day eventually and you can catch up – but it is very difficult to undo the damage caused by going on a new square when it is too wet or soft.
- Build weight up slowly – do not rush for the heavy roller and remember you can let the water out of the tanks in the roller!
- For more information and advice, including videos on technique produced by the ECB – visit www.groundsmanship.co.uk and head to the cricket section.
- There is more advice in the ECB TS4 document available from www.ecb.co.uk

Maintenance Recommendations For Cricket Outfields

Mowing. The grass shall be maintained between a height of 12 and 16 mm using cylinder mowing equipment. The grass should never be allowed to exceed a height of 20 mm. If the grass does become too long, the height of cut should be reduced gradually over 3 – 4 cuts allowing some time for recovery in between. N.B. On no account should the grass height be reduced by more than 50% on any one occasion. Overall, approximately 30 mowing operations may be required each year, depending on weather and growing conditions.

Fertiliser application. Allowance should be made for a sufficient number of fertiliser applications to maintain healthy growth and colour. The fertiliser regime should be based on the results of annual soil sampling to determine nutrient concentrations, but the following programme is provided as a guide:

- April 12:6:6 at 350 kg/ha
- September 5:5:20 at 350 kg/ha

Fertiliser shall be applied with appropriate equipment that ensures a uniform distribution.

Weed control. Apply a selective herbicide in the spring (if required) to combat the weeds present. This to be applied at least two weeks after the first fertiliser treatment (April) and at a time when grass growth is strong and healthy. NB. Do not apply herbicide during periods of potential turf stress, i.e. if the weather is hot and dry or if frosts are forecast. Apply herbicide strictly according to the manufacturer's label recommendations and only by suitably qualified personnel in accordance with pesticide regulations.

Pesticide/Fungicide [If required]. A pesticide/fungicide application may be required should disease be present within the grass sward. An approved fungicide should be used with activity against the pathogens present. Apply pesticides strictly according to the manufacturer's label recommendations and only by suitably qualified personnel in accordance with pesticide regulations.

Aeration / Compaction Alleviation. Verti-drain (or other similar de-compaction treatment) the outfield on at least two occasions in the spring and autumn. Use 18 mm diameter solid tines working to a minimum depth of 200 mm below the surface, heave should be kept to a minimum to maintain surface levels. Verti-draining must not be carried out if ground conditions are too soft or during frost.

Additional aeration treatments (ideally spiking) during the playing season would also be highly beneficial to maintain surface drainage rates. These treatments should only be undertaken when ground conditions are suitable. Slitting should not be used on clay outfields where there is a risk of shrink and swell as slit expansion is a risk.

Sand topdressing. Supply and spread an approved medium-fine sand suitable for sports use during the renovations period (end of cricket season) at the rate of 65 - 85 t/ha (approx. 4-5 mm depth). After each application, the sand should be worked into the surface with brushes or drag mats. This should be undertaken annually to maintain drainage performance

Overseeding. Overseed the outfield and safety margins as required at the application rate of approximately 200 kg/ha immediately after the end of season topdressing application. Use at least three cultivars of perennial ryegrass chosen from the latest Turfgrass Seed booklet with live ground cover and visual merit ratings of 6.5 or more. Make at least two passes with seeding equipment designed to place the seed approximately 5 mm below the surface.

Divot repair [Playing season]. After each match, divot and tread the divots from sliding boundary stops back into position. This will remove any bare soil which allows weeds and weed grasses to germinate. Filling in divots with seed/soil mix will help to maintain better grass coverage.

Renovation of worn areas [Playing season]. Areas of high wear should be dressed and seeded using a divot repair mix (seed/rootzone) during the playing season as required in order to maintain good grass cover. These areas should be hand watered (if necessary) to ensure rapid grass germination and establishment.

Boundary Marking [Playing season]. Line marking should be undertaken on a weekly basis during the playing season in accordance with cricket laws and league regulations.

Rolling. DO NOT roll your outfield with your cricket square roller as this will cause compaction and poor drainage. Outfield mowers should provide sufficient firmness and expect speed of the outfield to vary with cut height and weather through the season.

Further Information: for helpful advice on cricket grounds maintenance, including videos and a time planner – visit www.groundsmanSHIP.co.uk