



WHITE HORSE CONTRACTORS

SOIL AND WATER ENGINEERING FOR SPORT LANDSCAPE AND ENVIRONMENT

PROPOSED SPORTS FIELD CONDITION REPORT

Client: ALP

Site: Shinfield Pavilion – Northern Pitches

Address: Hyde End Road, Shinfield, RG2 9ES

Planning Ref:

Job Code: S22-075

Title: Condition Survey of Land for Proposed Sports Pitches

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NATURAL & HYBRID SPORTS TURF • LANDSCAPING & CIVIL ENGINEERING • LAND DRAINAGE
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Schedule of revisions

Rev	Date	Details	Author	Reviewer
0	08.09.22	FIRST ISSUE	JPW	
1	05.10.22	Revision to proposed pitch sizes.	JPW	
2	22.11.22	Update to Pitch Layout (Figure 12)	JPW	
3	11.10.23	Further update to Pitch Layout (Figures 1 and 12)	JPW	

1. EXECUTIVE SUMMARY

- i. White Horse Contractors Ltd has been commissioned by ALP Ltd, to undertake a condition survey of former agricultural land at High Copse Common, Shinfield West where it is proposed to construct a new sports field.
- ii. The proposed natural turf sports field could potentially accommodate the following facilities: 2 No. U13/U14 Youth Football Pitches.
- iii. The principal issues that could affect the quality of the proposed sports pitches can be summarised as follows:
 - a. The indigenous topsoil and subsoil are susceptible to mechanical damage and compaction due to the high sand content and low clay content. *In-situ* soakage tests (undertaken by RPS) proved the ground to be slowly permeable. In the absence of drainage, it is likely that infiltration rates will be < 5 mm / hour and so will not achieve the Performance Quality Standards (PQS) stipulated by Sport England and will limit the usage during the winter months.
 - b. The stone content of the indigenous topsoil is excessive.
 - c. The existing surface gradients in sections of the site are excessive for formal sport (>1.25% along the proposed line of play) whilst, in other areas, gradients are too shallow which could prevent efficient water movement across the pitch surfaces.
 - d. The existing surface vegetation is unsuitable for sports use.
- iv. To address these deficiencies, the following programme of works is suggested:
 - a. Undertake an earthworks exercise to optimise site gradients for sports use. This will require site clearance, topsoil strip, cut and fill earthworks within the subsoil, and topsoil replacement.
 - b. Screen the site-won topsoil through a rotary screener to remove over-sized stones.
 - c. Ameliorate the topsoil by adding green waste compost (PAS100) and by placing a 50 mm depth rootzone (80/20 sand/soil mix) carpet to provide further stone mitigation.
 - d. Install a surface bypass drainage scheme (Sport England Type 5) comprising a primary lateral drain network at 5 m centres in combination with sand slit secondary drainage. It is proposed that the drainage scheme can discharge into the existing attenuation basin that forms part of the site wide drainage infrastructure.
 - e. Subject to proving the viability of the existing borehole located adjacent to High Copse Farm, consider the installation of a manual irrigation system to serve the pitch area.
 - f. In addition to these works, the site will be cultivated, fertilised, and seeded and then maintained for a period of 12-months prior to first use.
- v. Based on Sport England guidance (Ref: Sport England Design Guidance Note "Natural Turf for Sport"), in its current, undrained state it is anticipated that the pitches may only sustain up to 2 hours of use per week on average without causing damage to the grass sward or soil structure. Usage greater than this may cause excessive wear and tear to the playing surfaces. Clearly, this will depend on rainfall patterns during the winter playing season. If the pitches were to be drained, e.g., a Sport England Type 5 drainage comprising lateral drains in combination with sand slits, reliable winter season usage should increase to approx. 3 – 6 hours of use per week for seniors or approx. 50% more than this for under 15's on average including training sessions and other informal usage.

incorporation of additional sand, etc.), initial maintenance during the maturation period and on-going maintenance.

- c. Indicative construction programme.
- d. Indicative cost estimates for the construction works.
- e. Recommendations for any future investigative work (e.g., contaminated land assessment).

3. SITE INFORMATION

3.1. Site location

The proposed new sports ground development is located to the south-west of Shinfield and can be accessed from the farm buildings at High Copse Farm located off Hyde End Road (Figure 2). The site is bounded by former arable farmland to the north, by a new housing development to the east, by a bus route and further sports ground to the south and by Hyde End Lane and residential properties to the west.

The site address is as follows: High Copse Farm, Hyde End Road, Shinfield, Berkshire, RG2 9ES.

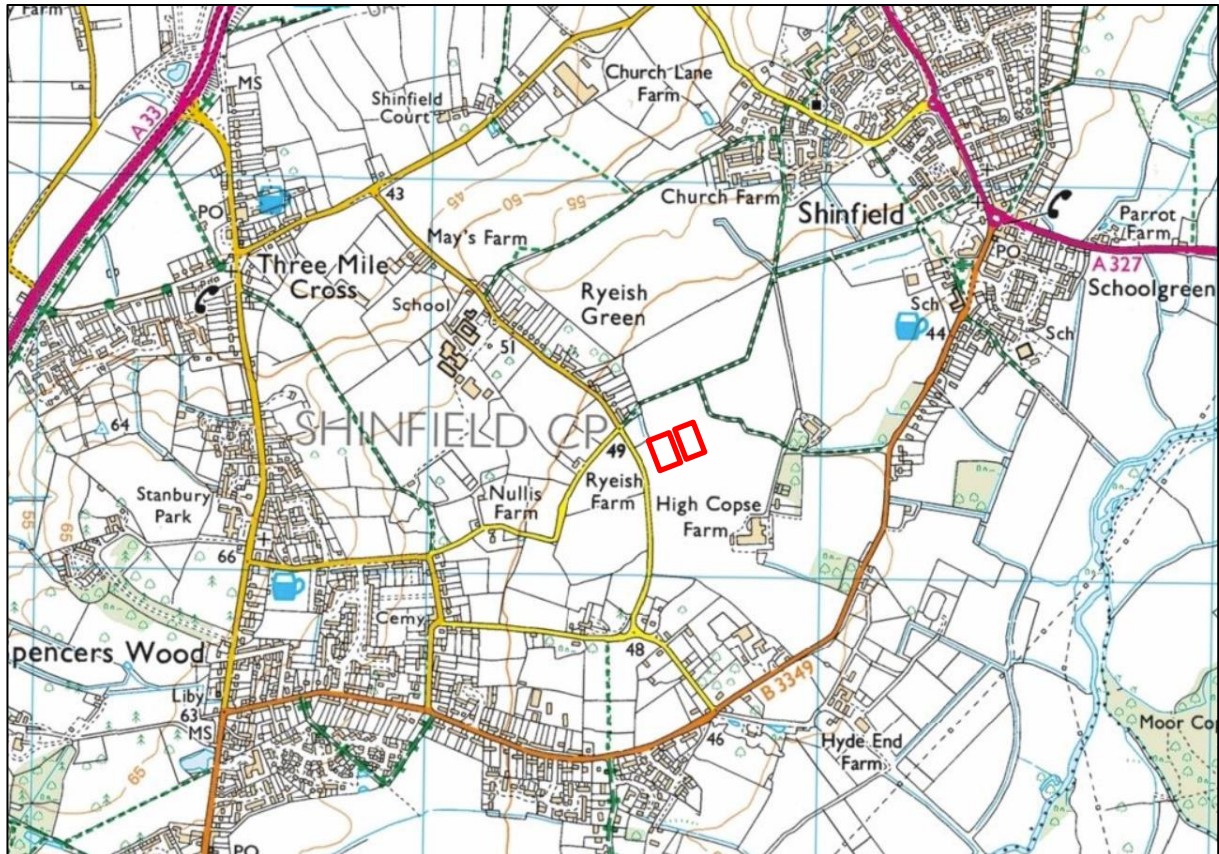


Figure 2. Site location plan of proposed new sports pitches (within red boundaries).

3.2. Site investigation

A site investigation was undertaken by Ollee Koster of White Horse Contractors Limited on the 16th August 2022. Weather conditions during the site assessment were hot, dry, and followed a very prolonged period of hot and dry weather (**N.B.** the summer of 2022 was one of the hottest and driest on record). Ground conditions were found to be very hard and dry.

It was anticipated that eight soil trial pits (TP1 – TP8) would be excavated using hand tools (spade and 45 mm diameter Dutch auger) to a maximum depth of 1.00 m within the proposed development area (please refer to Appendix 1 for locations). However, due to the hardness of the ground, it was not possible to excavate in all of these locations and excavation depth was generally limited to the upper 700 mm of the soil profile. The objectives of this were to assess the general composition and quality of the indigenous topsoil and subsoil to establish their suitability with respect to the construction of a new sports ground. The results from this exercise are summarised in the following sections.

3.3. Current land use and general condition

The area of interest currently comprises relatively flat land that is vegetated by self-set grasses and arable weeds (Figures 3 and 4). Although generally flat, the land becomes more sloping to the north of the proposed development area.



Figure 3. Site following harvest of forage maize.



Figure 4. Surface water accumulation in wheel ruts.

3.4. Former land use(s)

From historic mapping the land has been in agricultural production since at least 1898 and almost certainly for much longer than this. More recently, the site formed part of the University Farm (National Institute for Research in Dairying). According to mapping obtained from the Environment Agency's website (Date Accessed: 8th January 2018), there is no record of the site having been used for land filling purposes in the past.

3.5. Climate

The site lies within Agroclimatic Region 32, which equates to a mean annual rainfall of 713 mm (ADAS Reference Book 345).

3.6. Hydrology

The site is located on relatively flat land approx. 1 Km west of the river Loddon (Figure 2). There is a gentle slope from the point of highest elevation in the NNW to the SSW. There are no (obvious) natural water courses or drainage ditches located within or immediately adjacent to the development area. However, new attenuation basins that form part of the site wide drainage strategy have been excavated adjacent to the eastern side of the pitch areas. According to the UK Government website, Flood Map for Planning, (Date accessed: 8th September 2022), the site is in Flood Zone 1 (Low Risk). The site does not appear to be located within a groundwater source protection zone.

3.7. Topography

Generally, the site slopes from the point of highest elevation in the NNW to the SSE at an average gradient of approx. 0.65% (1:154) (Ref: TOPO – Shinfield Topo Survey.dwg supplied by ALP). Site gradients are generally compatible with the recommended limits specified by the Sports Governing Bodies, however, the gradient along the line of play (proposed) for the pitches at the north of the development area exceed the recommended guidelines; this area will require remodelling to provide compliant gradients. Please refer to the proposed pitch layout and existing ground levels presented in Appendix II.

Localised undulations and depressions (incl wheel ruts) are also present with the working area and will require correction to achieve the recommended standards for surface level uniformity. This could

be achieved through localised filling and surface grading within the topsoil (however, please note section on the control of over-sized stones).



Figure 5. General view of surface levels.



Figure 6. General view of surface levels.

3.8. Soils

According to the British Geological Society database the site is underlain by the following geology:

Bedrock Geology

London Clay Formation - Clay, Silt and Sand. Sedimentary Bedrock formed approximately 48 to 56 million years ago in the Palaeogene Period. Local environment previously dominated by deep seas.

Superficial deposits (where recorded)

River Terrace Deposits, 3 - Sand and Gravel. Superficial Deposits formed up to 3 million years ago in the Quaternary Period. Local environment previously dominated by rivers (U)

A detailed Ground Conditions Report was undertaken by RPS (Ref: JER7522; Rev 4 08.09.2009). With respect to the proposed sports field area:

The soil profile (from TP3 – within the proposed sports field area) comprised 0.5 m Loose medium brown slightly clayey silty SAND with rare sub-rounded fine to coarse gravel (Topsoil). This overlaid 1.30 m of Loose medium brown to orange brown slightly clayey and slightly silty sandy subangular to coarse chert gravel grading to coarse gravel with depth (River Terrace Deposits). This, in turn, overlaid a further 1.60 m of loose light brown grey slightly silty very sandy subangular to fine coarse chert GRAVEL (River Terrace Deposits). The trial pit was terminated at 3.40 m bgl.

In other areas of the main site, London Clay Formation was encountered at depths of between 0.30 and 2.00 m bgl.

No ground water (within 3.40 m of the surface) was detected in the proposed sports field area (TP3).

No contamination was detected in the sports field area, although contamination was noted in and around the adjacent farm buildings.

To characterise the underlying soil profile, a series of trial pits were excavated by hand. It was originally planned to excavate trial pits in eight locations (please refer to Appendix I), but due to very hard ground conditions this was only possible in six locations, namely TP1, TP2, TP3, TP6, TP7 and TP8. Again, due to the very hard conditions, the maximum depth of excavation using hand tools was approximately 700 mm. TPs 1 – 3 are the most relevant to the current proposed scheme. The profile descriptions are summarised below:

TP1 comprised 400 mm depth of very dry SANDY LOAM textured topsoil. The subsoil also comprised SANDY LOAM textured material. Both the topsoil and subsoil contained a large content of sharp-edged flint and stone in the size range of 10 – 80 mm.

TP2 comprised 410 mm depth of very dry SANDY LOAM textured topsoil. This trial pit was very similar to TP1. However due to high stone content and difficult digging conditions, the Dutch auger could only reach a depth of 500 mm bgl.

TP3 comprised 400 mm depth of very dry / Stoney SANDY LOAM textured topsoil. As per TP2, the Dutch auger failed to read a depth of 1.0 m due to the high content of sharp-edged flint and stone. The size of the stone was in the range of 10 – 80mm.

TP4 Due to ground conditions (stone content and dryness due to recent weather) within this area no excavation was possible with hand tools.

TP5 Due to ground conditions (stone content and dryness due to recent weather) within this area no excavation was possible with hand tools.

TP6 comprised approximately 400 mm depth of SANDY LOAM textured topsoil overlying SANDY LOAM textured subsoil that was virtually free from stones. The soil profile became slightly wetter with depth, but no free water was detected within 0.70 m of the surface. Topsoil and subsoil were of a better quality compared with TP1 -TP3.

TP7 comprised 270 mm depth of dry SANDY LOAM textured topsoil. Whilst stones were still evident, the overall stone content was lower than that observed in TPs 1 – 3. The subsoil comprised SANDY LOAM textured subsoil with chalk inclusions along with fine flint fragments.

TP8 was found to be of a very similar composition to TP7.

Figures 7 and 8 show the typical composition of the topsoil and stone content.



Figure 7. Typical topsoil profile.

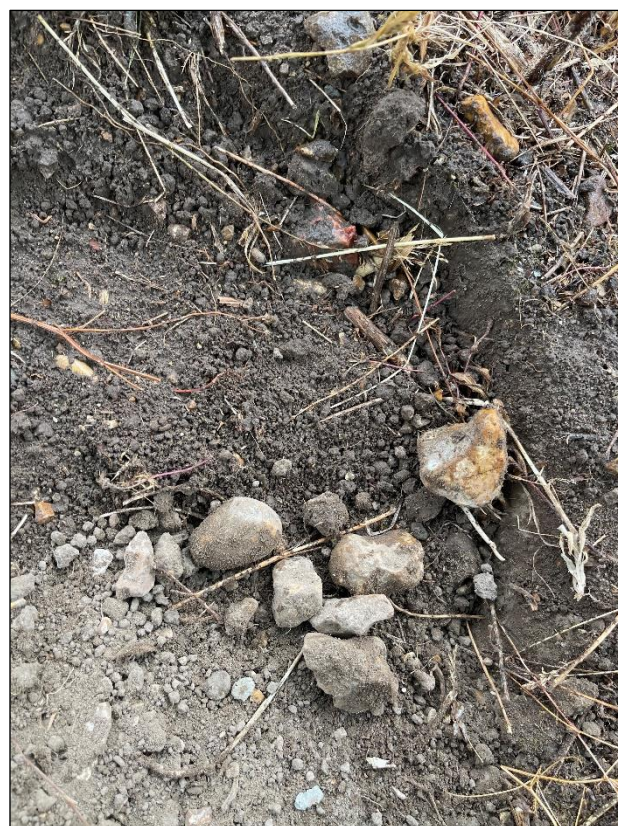


Figure 8. Close-up of stones present within the topsoil.

The results from a soil textural analysis are summarised in Table 1 and presented in full in Appendix II. The results concur with observations made during this site investigation and with the previous ground investigation trial pit and borehole descriptions.

Table 1. Soil texture results.

Pit No.	Depth (m)	Sand (%)	Silt (%)	Clay (%)	Classification
TP1	0.00 – 0.40	62	26	12	SANDY LOAM
	0.40 – 0.70	58	28	14	SANDY LOAM
TP2	0.00 – 0.41	67	22	11	SANDY LOAM
TP6	0.00 – 0.40	63	24	13	SANDY LOAM
	0.40 – 0.70	58	24	18	SANDY LOAM
TP7	0.00 – 0.27	69	20	11	SANDY LOAM
	0.27 – 0.70	65	22	13	SANDY LOAM
TP8	0.00 – 0.27	69	21	10	SANDY LOAM
	0.27 – 0.70	64	23	13	SANDY LOAM

The results from the assessment of soil nutrient and pH status are presented in Table 2.

Table 2. Topsoil nutrient and pH results.

Pit No.	Depth (m)	Phosphate (mg/l)	Index	Potassium (mg/l)	Index	Magnesium (mg/l)	Index	pH
TP1	0.00 – 0.40	47.8	4	138	2-	51	2	6.8
TP2	0.00 – 0.41	49.0	4	106	1	40	1	6.8
TP6	0.00 – 0.40	38.0	3	163	2-	79	2	6.7
TP7	0.00 – 0.27	32.6	3	94	1	59	2	6.8
TP8	0.00 – 0.27	38.6	3	190	2+	50	1	6.2

Indices of 2 and above indicate that there is sufficient supply of a particular nutrient. With reference to Table 2, the nutrient status of the topsoil is deficient for the major plant nutrient Potassium (K); the concentration of this nutrients can be raised through adjustment to the fertiliser regime. A soil pH in the range of 6.2 – 6.8 is within the ideal range (pH of 5.5 – 7.0) for the cultivation of perennial ryegrass which is the predominant species used for sports field construction.

Two bulked sample of topsoil (taken from Trial Pits 1 to 2 and 5 – 8) were submitted for analysis against the British Standard for topsoil (BS3882:2015) – Multi-Purpose. The full results are presented in Appendix III but, in summary, the bulked sample from Trial Pits 1 and 2 failed to meet the specification stipulated by the British Standard (BS3882:2015) due to low concentrations of Potassium and Magnesium and an excessive stone content. This can be remedied by adjustment to the fertiliser programme to increase the concentrations of these major plant nutrients and through topsoil screening to remove over-sized stone. The bulked sample from Trial Pits 5 – 8 met the requirements of the British Standard for Multi-Purpose Topsoil

3.9. Existing drainage infrastructure

No existing drainage infrastructure was observed within the proposed development area.

With respect to a drainage outfall, should a sports field drainage system be installed, there is sufficient freeboard to allow an outfall to be constructed into the newly constructed attenuation basin should this be acceptable. The attenuation basin includes a positive outlet leading from its southern end.

3.10. Anticipated drain flow rate

Based on the findings from the site assessment and topographical data which were used to parameterise the ADAS 345 model, peak drain flow (based on 1 in 10-year return period) is estimated to be as follows:

$$Q_o = S_T \times F \times A$$

Where: Q_o = Peak Flood Flow, S_T = Soil type factor, F = Conversion factor, A = Area (ha)
For this site: $S_T = 0.8$, $F = 8.0$, $A = 1.00$ ha

$$\therefore \text{Peak Flood Flow } (Q_o) = 0.8 \times 8.0 \times 1.0 = 6.4 \text{ l s}^{-1} \text{ for the total drained area of 1.00 ha}$$

3.11. Agronomic assessment

The site comprised self-set grasses and arable weeds (incl. ragwort) (Figures 9 and 10).



Figure 9. General view of vegetation.

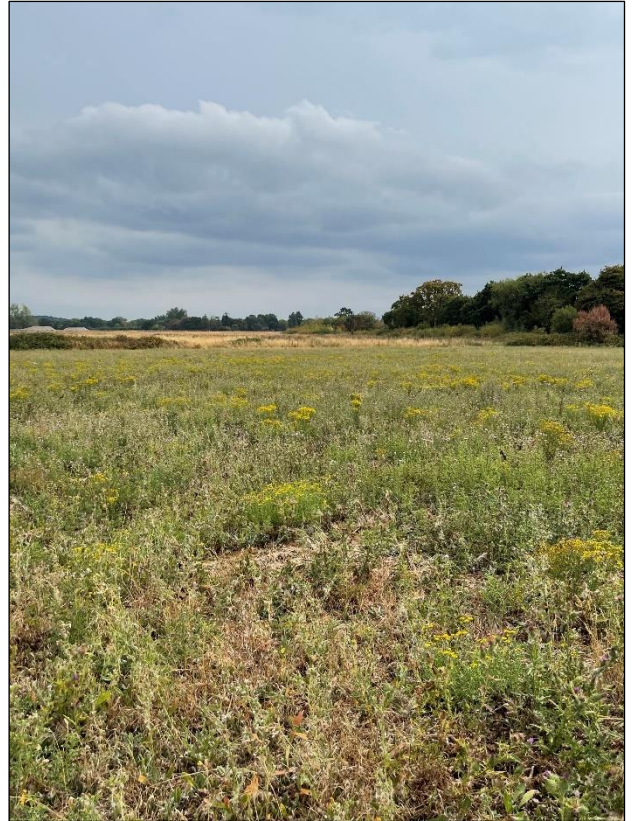


Figure 10. General view of vegetation.

3.12. Other issues

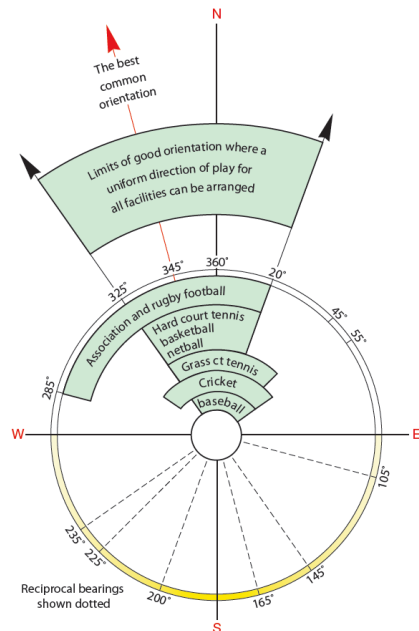
Access to the site appears to be satisfactory for construction equipment.

Details for drainage outfall (likely to be into existing attenuation basin) will need to be agreed.

4. DISCUSSION

The total proposed sports field area is approximately 10,000 m² and could potentially (subject to confirmation following the detailed design) accommodate the following sports facilities (please refer to Figure 12 for indicative layout):

- 2 Nr. Youth U13/U14 Football Pitches (11 v 11; each 82 m x 50 m + 3 m runoffs).



Recommended pitch orientation

(Goal to goal, wicket to wicket, or baseline to baseline based on the National Playing Fields Association's pitch and orientation diagram, but amended to take account of ECB guidance).

Figure 11. Guidance on pitch orientation (Sport England DGN "Natural Turf For Sport").

These sizes are consistent with the guidelines provided by Sport England and the FA.

References:

- The FA Guide to Pitch and Goalpost Dimensions.
- Comparative Sizes of Sports Pitches and Courts, September 2015, Sport England).

The proposed orientation of the pitches (337°) is consistent with the guidance provided by Sport England in their Design Guidance Note "Natural Turf for Sport" (Figure 11).

4.1. Indigenous soils

The indigenous soils on site typically comprise SANDY LOAM textured topsoil and subsoil which overly gravels. Soils with this textural classification tend to offer reasonably good natural drainage rates (if they are properly handled and not compacted). However, they are particularly susceptible to mechanical damage caused by trafficking and cultivation which can cause a significant decline in their natural drainage capacity.

Whilst in agricultural production it is possible to undertake annual subsoil loosening (if necessary) to relieve this mechanical damage and thereby maintain natural drainage capacity, the same options are not available once the field is laid down to sports pitches. Although there are machines designed for sports field aeration and de-compaction, they are not as effective as agricultural sub-soilers.

Furthermore, due to the low CLAY content, the soils tend not to re-structure naturally through shrink and swell cycles resulting from drying and wetting. Therefore, once compaction occurs, the only way to alleviate it is through mechanical intervention.

Finally, the soakaway tests undertaken as part of the ground investigation report referred to earlier suggest that the river terrace deposits are not necessarily as permeable as might be assumed from their textural composition. This is likely to be due to compaction (i.e., reduced volume of macro pores) and fine sand and silt particles tending to migrate and block transmission pores.

With this in-mind, it is recommended that a primary and secondary drainage scheme be installed to control excess surface water should natural drainage rates decline following construction and through use (e.g., Sport England Type 5). The addition of green waste compost (PAS100) can also assist with the maintenance of soil structure by physically separating the soil primary particles and preventing them from inter-packing.

The other principal issue of concern with the topsoil is the moderate to high content of sharp-edged and over-sized stones (10 – 80 mm in size) (e.g., Figure 8). These present a particular hazard to site users (risk of cuts and abrasions) and Sport England requires these to be controlled to an acceptable level to minimise these risks.

In general, there are three options available to address this problem:

1. Importing and placing a stone-free capping layer. Often, this would take the form of an imported rootzone (sand/soil mix) placed to achieve a minimum thickness of 100 mm. This is the most robust method to achieve a stone-free surface.
2. Topsoil screening using a rotary screener fitted with an appropriate gauge mesh. This is the next most robust method for de-stoning but requires the topsoil to be stripped from the field, screened, and then replaced. Given the stone content, it is estimated that losses/rejects from the screening process could be approx. 40% so in order to achieve a minimum of 100 mm depth of screened topsoil would require 167 mm depth to be stripped and screened. This method is not completely effective but greatly reduces the risk associated with stone at or near the surface.

This approach would allow the subsoil to be graded to uniform contours prior to topsoil replacement.

3. Stone picking and stone burying. This approach can be effective but will likely result in more stone remaining in the topsoil profile. A combination of stone harvesting (using a potato picker type machine) with stone burying can be effective but is very dependent on soil conditions at the time of the works. A hand stone pick may also be necessary.

4.2. Levels & Gradients

Existing site gradients are largely consistent with those recommended by Sport England and The Institute of Groundsmanship (please refer to Figure 12). Also, whilst acceptable, the gradients would benefit from being increased to some extent to improve water move across the pitch surfaces. Given this, it is proposed that the pitch area be re-modelled to optimise gradients and, at the same time improve minor surface level uniformity.

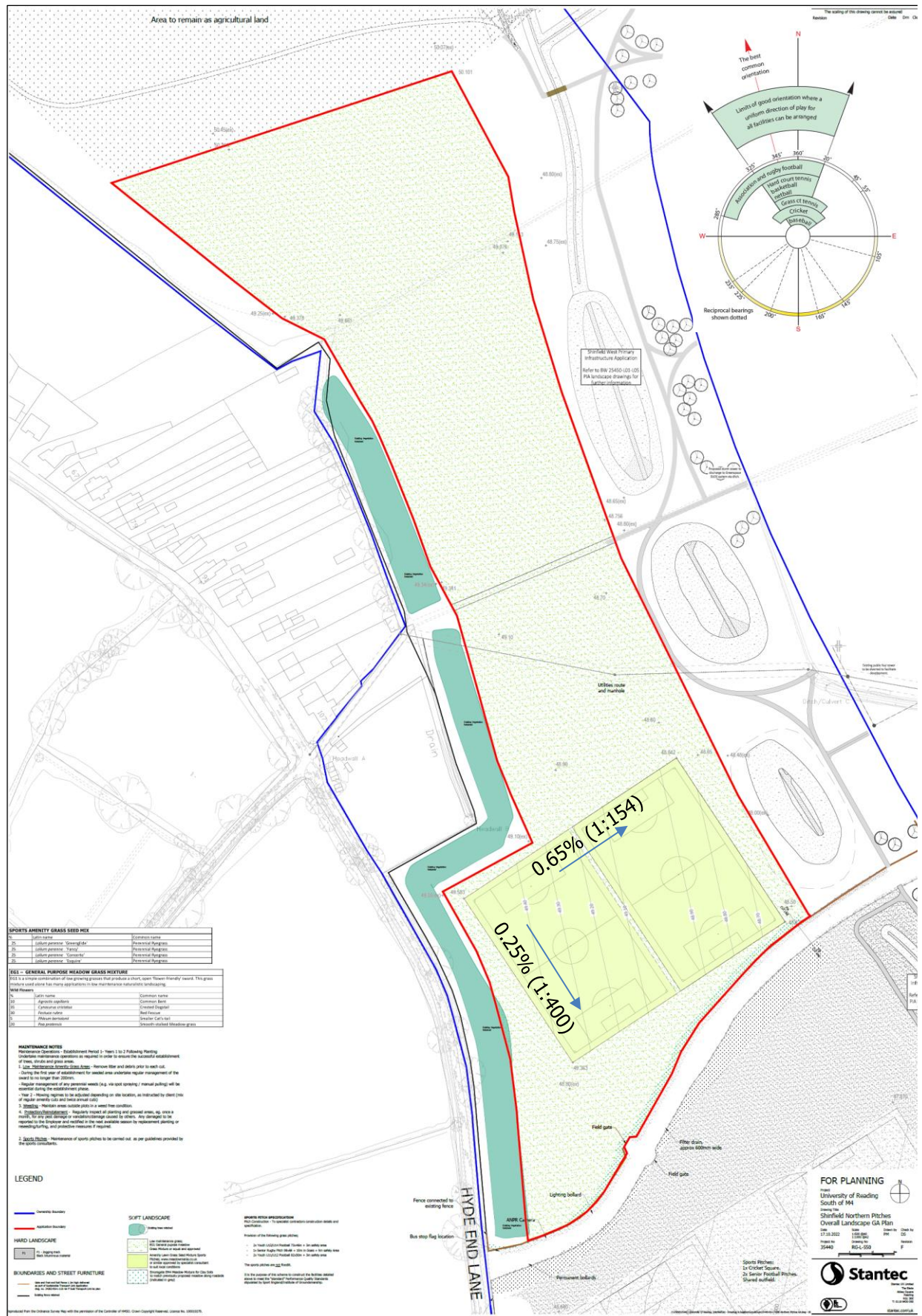


Figure 12. Proposed Pitch Layout and Gradients (Drawing 35440-RG-L-550F-Northern Pitches GA-00).

4.3. Drainage

Given the potential for impeded natural surface water drainage rates referred to above, it is recommended that a surface bypass drainage system be installed (Sport England Type 5) to assist with the removal of excess surface water which will help to improve the usability of the sports pitches during the winter months when the rate of rainfall exceeds the rate at which water can be removed through the natural drainage capacity of the soil or by evapotranspiration. A primary drainage scheme comprising lateral drains at 5 m centres in combination with TopDrain Sand Slits installed at 0.50 m centres would be appropriate in this situation.

4.4. Irrigation

Whilst often not a formal requirement for sports pitches at this level, the installation of a basic irrigation system would be a very helpful management tool to help maintain pitch quality during the summer period so that the pitches are vigorous entering into the winter sports season.

A borehole (for Agricultural Spray Irrigation) is located on the former High Copse Farm site and the viability of using this for sports field irrigation is currently under review.

4.5. Implications for future maintenance

The principal item that may be necessary beyond the normal maintenance practices for this site could be the requirement for watering during the summer months. This is because the water holding capacity of the light-textured soil is relatively low and so drought stress could occur at an earlier stage compared with a site on heavier, clay dominated soils. This problem is likely to become more severe if the pattern of drier, hotter summers continues as predicted.

The inclusion of more drought tolerant cultivars (deep rooted) and the addition of green-waste compost may help to limit the severity this problem. However, the installation of an irrigation system (see 4.4 above) would be the most robust solution.

5. RECOMMENDATIONS AND DEVELOPMENT OPTIONS

Based on the findings reported above, the following development options are recommended.

Please note:-

- The recommendations and development options presented in this document do not constitute a formal construction specification but do provide a general overview of the principles to be employed. To this end, this document should not be used for tendering or contractual purposes.
- It should be recognised that the weather and ground conditions that occur during the construction and growing-in phases of the project can have as profound effect on the quality of the completed project as the specification and methodology/implementation. To this end, the need for rigorous project management and site supervision by a suitably qualified engineer or agronomist during the construction phase cannot be over emphasised.
- The construction works should only be undertaken by a suitably qualified and adequately resourced Contractor.
- The construction and drainage works outlined below may be encompassed by the Construction, Design and Management Regulations (2015) and a Principal Designer may need to be employed to manage the health and safety aspects of the project before, during and after the construction works (please refer to "Managing health and safety in construction. Construction (Design and Management) Regulations 2015. Approved Code of Practice." Published by the Health & Safety Directorate.).

5.1. Site Clearance

The site should be sprayed with a total herbicide to control the existing vegetation. The site should then be flailed, and it may be necessary to remove the vegetative arising's to disposal on or off-site depending on the quantity of material.

5.2. Earthworks

The topsoil should be stripped to a depth of approximately 350 mm and removed to a temporary stockpile on-site. The topsoil should then be screened using a rotary drum screener fitted with a 15 mm (TBC) gauge screen to remove over-sized stone. Rejects from this operation should be removed to disposal on-site. The screened topsoil should be returned to a temporary stockpile and tracked-in to prevent ingress of rainwater. Depending on the percentage of rejects, if 350 mm depth were screened it is anticipated that this would produce approx. 200 – 250 mm thickness of screened topsoil.

The exposed formation surface should be cut and filled to produce the proposed site gradients and then trimmed / laser graded to achieve uniformly graded plateaux. The formation surface should then be thoroughly sub-soiled using an agricultural Shakerator to a depth of approx. 600 mm with legs at 600 mm centres. Following sub-soiling, the formation surface shall be re-trimmed to achieve suitable tolerances prior to topsoil replacement.

The screened topsoil should be spread over the formation surface in a single layer to achieve a firmed topsoil depth of at least 200 mm everywhere. Following spreading, the topsoil shall be trimmed to final design tolerances before proceeding with the drainage installation works.

5.3. Drainage

It is recommended that a surface bypass drainage scheme be installed comprising lateral drains at 5 m centres in combination with TopDrain Sand Slits installed at 0.50 m centres (Sport England Type

5). It is proposed (subject to confirmation) that the outfall from the drainage scheme should discharge into the water attenuation basin.

5.4. Soil Improvement, Cultivations & Seeding

Prior to the drainage work, the topsoil shall be stone buried / stone picked to control any remaining over-sized stones.

Following the primary pipe drainage works, the playing field should be cultivated to restore surface level uniformity. At the same time, green waste compost (produced according to PAS100) could be added at the rate of 10% by volume and mixed-in to upper 200 mm depth of topsoil.

Following the installation of the secondary drainage scheme, a 50 mm depth of an approved rootzone (80/20 sand/soil mix) shall be placed over the surface of the pitches to provide further stone mitigation.

Finally, a seedbed should be prepared, followed by fertilisation (pre-seeding fertiliser applied at 35 g/m²) and seeding using an approved sports seed mixture drilled in 3 directions @ 35 g/m².

5.5. Irrigation

Subject to the findings from the borehole investigation, it may be possible to extend a manual irrigation system into the proposed sports pitch area comprising main line irrigation pipes, hydrant points and travelling sprinklers (e.g., Speedy Rain 405 hose reels with rain guns)

5.6. Initial Maintenance

It is recommended that the site is established and maintained for a 12-month period prior to first use to ensure that the grass sward has matured sufficiently to accommodate sports use. This will include:

- Mowing (30 cuts)
- Fertilisation (4 Nr.)
- Decompaction/Aeration (2 Nr.)
- Overseeding
- Sand topdressing (1 x 8 mm depth application)
- Application of selective herbicide (if necessary)
- Topping up drain lines (if necessary)

5.7. Performance Testing

Prior to handover, the pitches shall be tested by a suitably qualified independent test house to confirm the pitches meet the Performance Quality Standards stipulated by Sport England. The PQS report, along with as-built records of drainage, details of materials and products used in the construction, and an operation and maintenance manual shall be provided to the client at completion of the 12-months maintenance period.

6. INDICATIVE CONSTRUCTION PROGRAMME

S22-075 HIGH COPSE COMMON (NORTH) SPORTS PITCHES	2024												2025											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Mobilisation																								
Earthworks																								
Drainage (Primary)																								
Drainage (Secondary)																								
Cultivations and seeding incl Rootzone Carpet																								
Maintenance Period																								
Winter sports pitches ready for use																								

N.B. The precise date that the site will be ready for use is highly dependent on the weather and ground conditions that prevail during the construction phase and growing-in period.

7. CONTACT DETAILS

Confidentiality

This report and associated concept drawings is confidential and is only for the use of officers of ALP, University of Reading and associated project team members. No copies of this report are to be made and information contained herein should not be communicated to any third party without the specific consent in writing of White Horse Contractors Limited.

Dr. James P. Welsh
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8. APPENDIX I: SOIL SAMPLING POSITIONS



Soil Sampling Locations.

9. APPENDIX II: SOIL ANALYSIS RESULTS

ANALYSIS REPORT



Contact : WHITE HORSE CONTRACTORS THE STABLES STEPHENS YARD ENBOURNE NEWBURY BERKSHIRE RG20 0HA Tel. : 01865 736 272	Client : HIGH COPSE COMMON
W319	
Please quote the above code for all enquiries	
Sample Matrix : Agricultural Soil	Laboratory Reference Card Number 11407/22
Date Received 22-Aug-22 Date Reported 26-Aug-22	

SOIL ANALYSIS REPORT

Laboratory Sample Reference	Field Details			Index			mg/l (Available)		
	No.	Name or O.S. Reference with Cropping Details	Soil pH	P	K	Mg	P	K	Mg
50195/22	1	TP1 TOP <i>No cropping details given</i>	6.8	4	2-	2	47.8	138	51
50196/22	2	TP1 SUB <i>No cropping details given</i>	7.2	3	2-	2	25.6	130	53
50197/22	3	TP2 TOP <i>No cropping details given</i>	6.8	4	1	1	49.0	106	40
50198/22	4	TP6 TOP <i>No cropping details given</i>	6.7	3	2-	2	38.0	163	79
50199/22	5	TP6 SUB <i>No cropping details given</i>	7.1	1	2-	3	14.2	135	121
50200/22	6	TP7 TOP <i>No cropping details given</i>	6.8	3	1	2	32.6	94	59

*If general fertiliser and lime recommendations have been requested, these are given on the following sheets.
 The analytical methods used are as described in DEFRA Reference Book 427
 The index values are determined from the AHDB Fertiliser Recommendations RB209 9th Edition.*

Released by Katie Dunn On behalf of NRM Date 26/08/22



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ANALYSIS REPORT



Contact : WHITE HORSE CONTRACTORS
THE STABLES
STEPHENS YARD
ENBOURNE
NEWBURY
BERKSHIRE RG20 0HA
Tel. : 01865 736 272

W319

Please quote the above code for all enquiries

Client : HIGH COPSE COMMON

Sample Matrix : Agricultural Soil

Laboratory Reference

Card Number 11407/22

Date Received 22-Aug-22

Date Reported 26-Aug-22

SOIL ANALYSIS REPORT

Laboratory Sample Reference	Field Details			Index			mg/l (Available)		
	No.	Name or O.S. Reference with Cropping Details	Soil pH	P	K	Mg	P	K	Mg
50201/22	7	TP7 SUB <i>No cropping details given</i>	7.2	2	1	1	22.4	88	46
50202/22	8	TP8 TOP <i>No cropping details given</i>	6.2	3	2+	1	38.6	190	50
50203/22	9	TP8 SUB <i>No cropping details given</i>	6.9	3	2-	2	28.0	133	59

If general fertiliser and lime recommendations have been requested, these are given on the following sheets.

The analytical methods used are as described in DEFRA Reference Book 427

The index values are determined from the AHDB Fertiliser Recommendations RB209 9th Edition.

Released by Katie Dunn On behalf of NRM Date 26/08/22



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ANALYSIS REPORT



MICRO NUTRIENT REPORT

DATE **26th August 2022**
SAMPLES FROM **HIGH COPSE COMMON**

WHITE HORSE CONTRACTORS
THE STABLES
STEPHENS YARD
ENBOURNE
NEWBURY
BERKSHIRE RG20 0HA
Tel: 01865 736 272

Reference: 11407/50195/22	Field Name: TP1 TOP	Result	(*)
Sand (2.00 - 0.063mm) %		62	
Silt (0.063 - 0.002mm) %		26	
Clay (< 0.002mm) %		12	
Textural Classification	Sandy Loam		1

Reference: 11407/50196/22	Field Name: TP1 SUB	Result	(*)
Sand (2.00 - 0.063mm) %		58	
Silt (0.063 - 0.002mm) %		28	
Clay (< 0.002mm) %		14	
Textural Classification	Sandy Loam		1

Reference: 11407/50197/22	Field Name: TP2 TOP	Result	(*)
Sand (2.00 - 0.063mm) %		67	
Silt (0.063 - 0.002mm) %		22	
Clay (< 0.002mm) %		11	
Textural Classification	Sandy Loam		1

Reference: 11407/50198/22	Field Name: TP6 TOP	Result	(*)
Sand (2.00 - 0.063mm) %		63	
Silt (0.063 - 0.002mm) %		24	
Clay (< 0.002mm) %		13	
Textural Classification	Sandy Loam		1

Reference: 11407/50199/22	Field Name: TP6 SUB	Result	(*)
Sand (2.00 - 0.063mm) %		58	
Silt (0.063 - 0.002mm) %		24	
Clay (< 0.002mm) %		18	
Textural Classification	Sandy Loam		1

Reference: 11407/50200/22	Field Name: TP7 TOP	Result	(*)
Sand (2.00 - 0.063mm) %		69	
Silt (0.063 - 0.002mm) %		20	
Clay (< 0.002mm) %		11	
Textural Classification	Sandy Loam		1

Reference: 11407/50201/22	Field Name: TP7 SUB	Result	(*)
Sand (2.00 - 0.063mm) %		65	
Silt (0.063 - 0.002mm) %		22	
Clay (< 0.002mm) %		13	
Textural Classification	Sandy Loam		1

Reference: 11407/50202/22	Field Name: TP8 TOP	Result	(*)
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Report continued.....



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ANALYSIS REPORT



MICRO NUTRIENT REPORT

DATE **26th August 2022**
SAMPLES FROM **HIGH COPSE COMMON**

WHITE HORSE CONTRACTORS
THE STABLES
STEPHENS YARD
ENBOURNE
NEWBURY
BERKSHIRE RG20 0HA
Tel: 01865 736 272

Reference: 11407/50202/22	Field Name: TP8 TOP	Result	(*)
Sand (2.00 - 0.063mm) %		69	
Silt (0.063 - 0.002mm) %		21	
Clay (< 0.002mm) %		10	
Textural Classification	Sandy Loam		1

Reference: 11407/50203/22	Field Name: TP8 SUB	Result	(*)
Sand (2.00 - 0.063mm) %		64	
Silt (0.063 - 0.002mm) %		23	
Clay (< 0.002mm) %		13	
Textural Classification	Sandy Loam		1

Notes (*)

- (1) In calcareous soils the sand, silt and clay sized fractions are likely to contain particles of carbonate which may result in the incorrect classification of soil type.



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ANALYSIS REPORT



DATE 26th August 2022
SAMPLES FROM HIGH COPSE COMMON

SAMPLED BY

Report reference 11407/22

WHITE HORSE CONTRACTORS
THE STABLES
STEPHENS YARD
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Fax:

Fertiliser Recommendations

The phosphate and potash recommendations shown below, are those required to replace the offtake and maintain target soil indices. The larger recommended applications for soils below target index will allow the soil to build up to this target index over a number of years. Not applying fertiliser to soils which are above target index will allow the soil to run down over a number of years to the target index.

The recommendation should be increased or decreased where yields are substantially more or less than that specified. The amount to apply can be calculated using the expected yield and values for the offtake of phosphate and potash per tonne of yield given in the RB209 9th edition.

All recommendations are given for the mid-point of each Index.

Where a soil analysis value (as given by the laboratory) is close to the range of an adjacent Index, the recommendation may be reduced or increased slightly taking account of the recommendation given for the adjacent Index. Small adjustments of less than 10 kg/ha are generally not justified.

Efficient use of P and K is most likely to be achieved on soils that are well structured and enable good rooting.

For visual evaluation of soil structure (VESS), a score on 1 or 2 would be considered adequate.

Don't forget to deduct nutrients applied as organic manures.

For Nitrogen recommendations please refer to the RB209 9th edition or seek advice from an FACTS qualified adviser.

Target Indices:

Arable, Forage, Grassland and Potato Crops: P Index 2, K Index 2-

(In rotations where most crops are Autumn-sown, soils are in good condition and P is applied annually, high index 1 can be an adequate target.)

Vegetables and Bulbs: P Index 3, K Index 2+

(If vegetables are only grown occasionally as part of an arable rotation, it would be most economic to target index 2 for arable and forage crops.)

Fruit Vines and Hops: P Index 2, K Index 2, Mg Index 2

(Note: Cider apples respond to K Index 3, Mg Index 3)

A lime recommendation is usually for a 20cm depth of cultivated soil or a 15cm depth of grassland soil. Where soil is acid below 20 cm and soils are ploughed for arable crops, a proportionately larger quantity of lime should be applied. However, if more than 10 t/ha is needed, half should be deeply cultivated into the soil and ploughed down, with the remainder applied to the surface and worked in.

For established grassland or other situations where there is no, or only minimal soil cultivation, no more than 7.5 t/ha of lime should be applied in one application.

In these situations, applications of lime change the pH below the surface very slowly. Consequently, the underlying soil should not be allowed to become too acidic because this will affect the root growth and thus limit nutrient and water uptake, which will adversely affect yield.

Field Name / Ref / Soil Type	Last Crop / Next Crop	P2O5	K2O	MgO	Lime (Arable) (Grass)	
TP1 TOP	Not Given / Not Given	Units/Acre			T/Ac	0
050195 / Medium		Kg/Ha			Te/Ha	0
TP1 SUB	Not Given / Not Given	Units/Acre			T/Ac	0
050196 / Medium		Kg/Ha			Te/Ha	0
TP2 TOP	Not Given / Not Given	Units/Acre			T/Ac	0
050197 / Medium		Kg/Ha			Te/Ha	0
TP6 TOP	Not Given / Not Given	Units/Acre			T/Ac	0
050198 / Medium		Kg/Ha			Te/Ha	0
TP6 SUB	Not Given / Not Given	Units/Acre			T/Ac	0
050199 / Medium		Kg/Ha			Te/Ha	0

Fertiliser recommendations are based on **AHDB RB209 (Ninth Edition)**. If a nutrient is deficient and no recommendation is given, either no recommendation is given in RB209 or we have insufficient data to give a recommendation. Apply Lime to the nearest half Ton / Tonne. NRM is a UKAS accredited laboratory to ISO/IEC 17025

Report continued.....



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ANALYSIS REPORT



DATE 26th August 2022
SAMPLES FROM HIGH COPSE COMMON

SAMPLED BY

Report reference 11407/22

WHITE HORSE CONTRACTORS
THE STABLES
STEPHENS YARD
ENBOURNE
NEWBURY
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Fax:

Fertiliser Recommendations

Field Name / Ref / Soil Type	Last Crop / Next Crop	P2O5	K2O	MgO	Lime (Arable)	(Grass)	
TP7 TOP	Not Given / Not Given	Units/Acre			T/Ac	0	0
050200 / Medium		Kg/Ha			Te/Ha	0	0
Field Name / Ref / Soil Type	Last Crop / Next Crop	P2O5	K2O	MgO	Lime (Arable)	(Grass)	
TP7 SUB	Not Given / Not Given	Units/Acre			T/Ac	0	0
050201 / Medium		Kg/Ha			Te/Ha	0	0
Field Name / Ref / Soil Type	Last Crop / Next Crop	P2O5	K2O	MgO	Lime (Arable)	(Grass)	
TP8 TOP	Not Given / Not Given	Units/Acre			T/Ac	1.4	0
050202 / Medium		Kg/Ha			Te/Ha	3.5	0
Field Name / Ref / Soil Type	Last Crop / Next Crop	P2O5	K2O	MgO	Lime (Arable)	(Grass)	
TP8 SUB	Not Given / Not Given	Units/Acre			T/Ac	0	0
050203 / Medium		Kg/Ha			Te/Ha	0	0

Fertiliser recommendations are based on **AHDB RB209 (Ninth Edition)**. If a nutrient is deficient and no recommendation is given, either no recommendation is given in RB209 or we have insufficient data to give a recommendation. Apply Lime to the nearest half Ton / Tonne.
NRM is a UKAS accredited laboratory to ISO/IEC 17025



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Certificate of Analysis

Client: WHITE HORSE CONTRACTORS
(W319) THE STABLES
STEPHENS YARD
ENBOURNE
NEWBURY
BERKSHIRE RG20 0HA

Originator: HIGH COPSE COMMON
SOIL

Lab ID: 30114 - 574547
Sample ID: BULK SAMPLE TP 1-4
Sample Weight: 1069g

Date Received: 19/08/2022
Date Reported: 31/08/2022

BS 3882 : 2015 SPECIFICATION FOR TOPSOIL Fails BS 3882

				Compliant with range (Y/N)				
				Multi-P	Acid	Calc	Low-F	Low-F
							Acid	Calc
		Unit	Result					
Texture:	Clay	% w/w	14					
	Silt	% w/w	20					
	Sand	% w/w	66					
	Textural Class		Sandy Loam	Y	Y	Y	Y	Y
Organic Matter:		% w/w	3.6	Y	Y	Y	Y	Y
Coarse	>2 mm	% w/w	21.9	Y	Y	Y	Y	Y
Fragment	>20 mm	% w/w	15.1	N	N	N	N	N
Content:	>50 mm	% w/w	8.2	N	N	N	N	N
Soil pH:			6.4	Y	N	N	Y	N
Carbonate:		% w/w	<1			N		N
Available	Nitrogen	% w/w	0.166	Y	Y	Y		
Plant	Phosphorus	mg/l	51.8 (4)*	Y	Y	Y	N	N
Nutrients:	Potassium	mg/l	108.8 (1)*	N	N	N		
	Magnesium	mg/l	39.0 (1)*	N	N	N		
Carbon:Nitrogen Ratio:		:1	12.6	Y	Y	Y	Y	Y
Exchangeable Sodium Percentage:		%	0.5					
Phytotoxic	Total Zinc	mg/kg	35.1	Y	Y	Y	Y	Y
Contaminants:	Total Copper	mg/kg	13.2	Y	Y	Y	Y	Y
	Total Nickel	mg/kg	11.0	Y	Y	Y	Y	Y
Visible	> 2mm	% w/w	0.00	Y	Y	Y	Y	Y
Contaminants:	Plastics	% w/w	0.00	Y	Y	Y	Y	Y
	Number of Sharps		0	Y	Y	Y	Y	Y
Additional	Available Sodium	mg/l	9.4					
Analysis:	Available Calcium	mg/l	1522.3					
	Conductivity	uS/cm	2019	Y				
Compliance:				N	N	N	N	N

Results are expressed on a dry matter basis.
* Soil indices from RB209

Released by: Joe Cherrie

Date: 31/08/2022

DECLARATION: I certify that this sample has been analysed by NRM in accordance with BS 3882 Specification for Topsoil (2015).

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Analytical Report

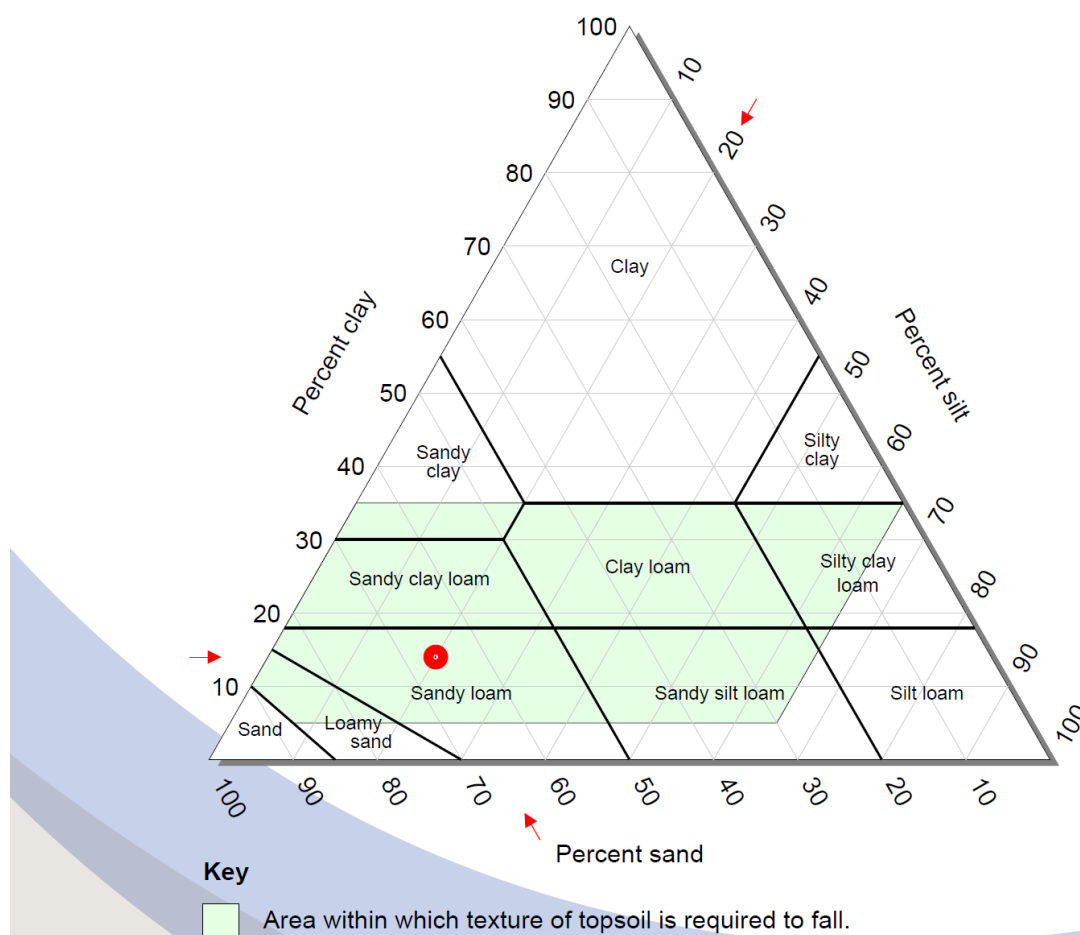
Client: WHITE HORSE CONTRACTORS
(W319) THE STABLES
STEPHENS YARD
ENBOURNE
NEWBURY
BERKSHIRE RG20 0HA

Originator: HIGH COPSE COMMON
SOIL

Lab ID: 30114 - 574547
Sample ID: BULK SAMPLE TP 1-4
Sample Weight: 1069g

Date Received: 19/08/2022
Date Reported: 31/08/2022

Fig. 1. Textural Class: Sandy Loam (compliant)



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Certificate of Analysis

Client: WHITE HORSE CONTRACTORS
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ENBOURNE
NEWBURY
BERKSHIRE RG20 0HA

Originator: HIGH COPSE COMMON
SOIL

Lab ID: 30114 - 574548
Sample ID: BULK SAMPLE TP 5-8
Sample Weight: 2880g

Date Received: 19/08/2022
Date Reported: 31/08/2022

BS 3882 : 2015 SPECIFICATION FOR TOPSOIL Multipurpose Grade

				Compliant with range (Y/N)					
				Multi-P	Acid	Calc	Low-F	Low-F	Low-F
								Acid	Calc
		Unit	Result						
Texture:	Clay	% w/w	17						
	Silt	% w/w	17						
	Sand	% w/w	66						
	Textural Class		Sandy Loam	Y	Y	Y	Y	Y	Y
				See area of permitted soil textural classes in Fig. 1.					
Organic Matter:		% w/w	3.3	Y	Y	Y	Y	Y	Y
Coarse	>2 mm	% w/w	12.0	Y	Y	Y	Y	Y	Y
Fragment	>20 mm	% w/w	8.3	Y	Y	Y	Y	Y	Y
Content:	>50 mm	% w/w	0.0	Y	Y	Y	Y	Y	Y
Soil pH:			6.5	Y	N	N	Y	N	N
Carbonate:		% w/w	<1			N			N
Available	Nitrogen	% w/w	0.154	Y	Y	Y			
Plant	Phosphorus	mg/l	36.2 (3)*	Y	Y	Y	N	N	N
Nutrients:	Potassium	mg/l	137.8 (2-)*	Y	Y	Y			
	Magnesium	mg/l	59.3 (2)*	Y	Y	Y			
Carbon:Nitrogen Ratio:		:1	12.4	Y	Y	Y	Y	Y	Y
Exchangeable Sodium Percentage:		%	0.7						
Phytotoxic	Total Zinc	mg/kg	40.4	Y	Y	Y	Y	Y	Y
Contaminants:	Total Copper	mg/kg	15.4	Y	Y	Y	Y	Y	Y
	Total Nickel	mg/kg	<10	Y	Y	Y	Y	Y	Y
Visible	> 2mm	% w/w	0.00	Y	Y	Y	Y	Y	Y
Contaminants:	Plastics	% w/w	0.00	Y	Y	Y	Y	Y	Y
	Number of Sharps		0	Y	Y	Y	Y	Y	Y
Additional	Available Sodium	mg/l	12.8						
Analysis:	Available Calcium	mg/l	1375.3						
	Conductivity	uS/cm	2032	Y					
Compliance:				Y	N	N	N	N	N

Results are expressed on a dry matter basis.
* Soil indices from RB209

Released by: Joe Cherrie

Date: 31/08/2022

DECLARATION: I certify that this sample has been analysed by NRM in accordance with BS 3882 Specification for Topsoil (2015).

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Analytical Report

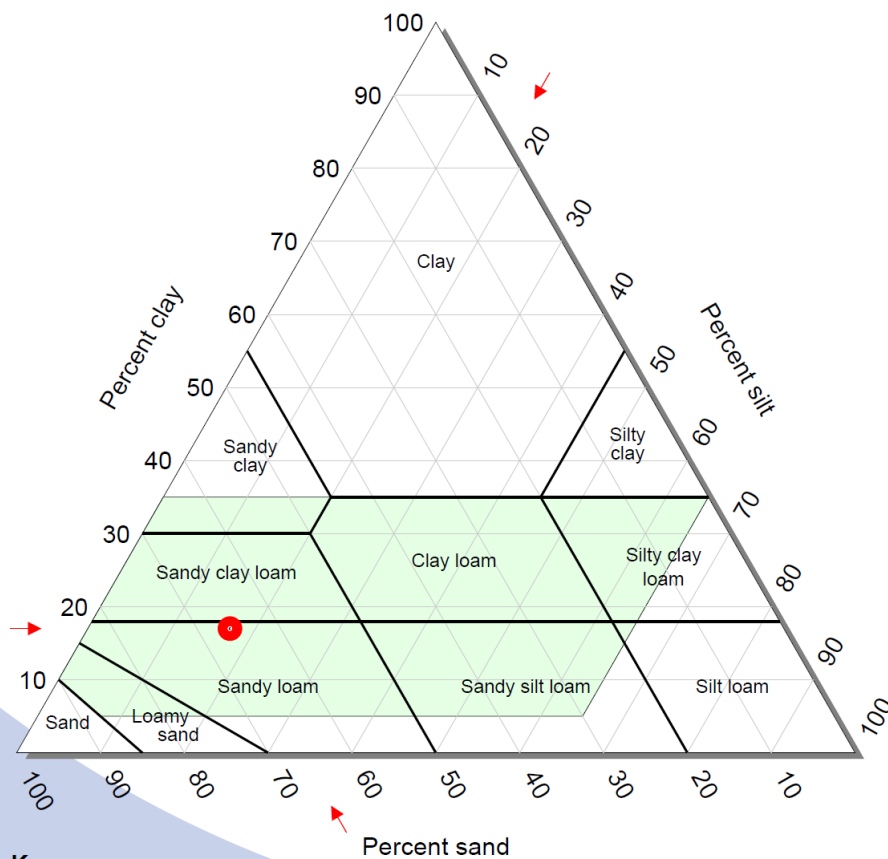
Client: WHITE HORSE CONTRACTORS
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Originator: HIGH COPSE COMMON
SOIL

Lab ID: 30114 - 574548
Sample ID: BULK SAMPLE TP 5-8
Sample Weight: 2880g

Date Received: 19/08/2022
Date Reported: 31/08/2022

Fig. 1. Textural Class: Sandy Loam (compliant)



Key

 Area within which texture of topsoil is required to fall.

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