

**BOGNOR REGIS GOLF CLUB
AND
LAND NORTH OF ANCTON,
WEST SUSSEX**

**AGRICULTURAL LAND
CLASSIFICATION**

November 2021





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Plans

- KCC3121/01 Auger Point Plan
- KCC3121/02 Agricultural Land Classification Plan

1 INTRODUCTION

- 1.1 This report sets out the results of an Agricultural Land Classification (ALC) of land north of Ancton. The site is edged red below.

Insert 1: The Site

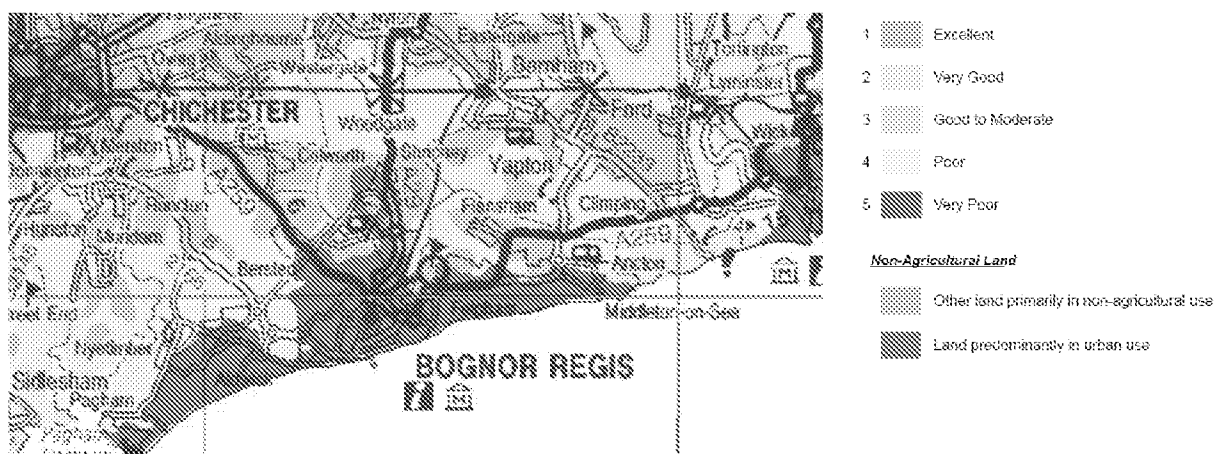


- 1.2 The majority of the site was surveyed by a ADAS Reading in January 1993. That survey was carried out under the current methodology for ALC and accordingly remains valid and can be relied upon.
- 1.3 The northern part of the site, extending to 11.6ha, has not previously been surveyed and accordingly we have carried out a detailed ALC of that area. An extra area of 11.9 ha has since been added and is currently unsurveyed.
- 1.4 This report sets out the results.
- 1.5 The report also provides the ALC information for land around Bognor Regis Golf Club. The golf course is classified as “non agricultural land”.
- 1.6 The report is structured as follows:
- section 2 reviews published and predictive ALC information;
 - section 3 sets out the ALC of the majority of the site;
 - section 4 sets out the ALC of the northern part of the site;
 - and section 5 combines the results to provide an ALC of the whole site.

2 PUBLISHED AND PREDICTIVE ALC INFORMATION

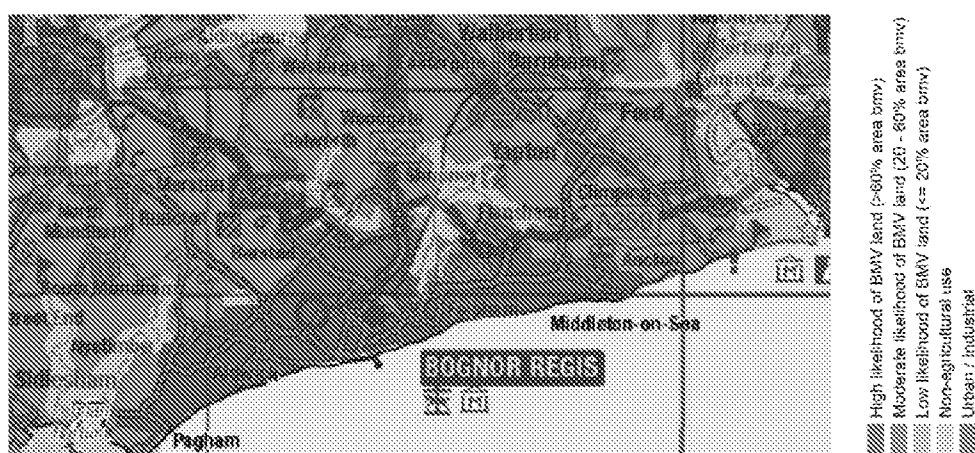
- 2.1 The published “provisional” ALC maps from the 1970s show much of the land around Bognor Regis as Grade 1 “excellent” and Grade 2 “very good” quality land, with areas of undifferentiated Grade 3 mostly associated with flood plains of watercourses. An extract is reproduced below.

Insert 2: Provisional MAFF ALC



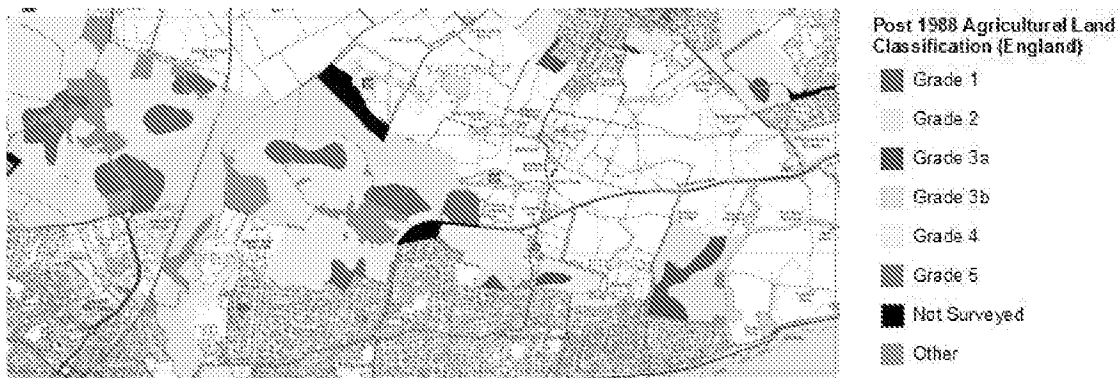
- 2.2 These maps were produced under a previous ALC methodology and were not the result of extensive field survey. They are not to be relied upon for site-specific site analysis.
- 2.3 In 2017 Natural England produced Predictive “Likelihood of ‘Best and Most Versatile’ (BMV) Agricultural Land” maps. Published at a scale of 1:250,000 they divide areas into low, medium and high likelihood of BMV, with high being >60% of the area being BMV.
- 2.4 For the area around Bognor Regis almost all the land is expected to fall into the “high likelihood of BMV (>60% area BMV)” category, except for some areas affected by rivers, as shown below.

Insert 3: Predictive BMV Map



- 2.5 As can be seen, there is one area of “moderate likelihood of BMV (20 – 60% area BMV)” at Ancton, which correlates with much of the application site.
- 2.6 Available survey data shows the land in the area to be generally high quality except where affected by rivers, with some poorer quality land (including the site) to the east.

Insert 4: Published ALC Results



- 2.7 The golf course has partially been recorded as non-agricultural land. The non-surveyed section does not need to be surveyed as it also falls under non-agricultural land in the ALC.

3 ALC OF THE MAJORITY OF THE SITE

3.1 The majority of the site was surveyed by ADAS Reading in January 1993. The survey was carried out at a detailed scale of one boring per hectare.

3.2 The ALC report and plan are set out in **Appendix KCC1**.

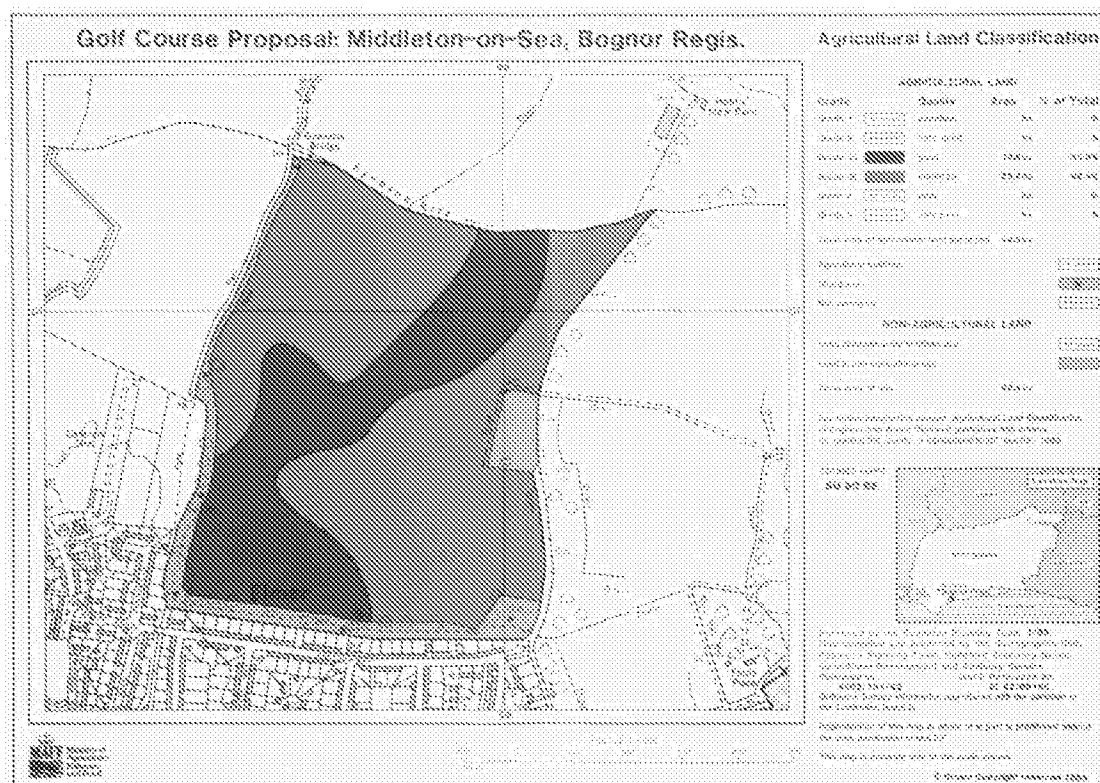
3.3 The ALC results mapped the site as follows:

Table KCC1: ADAS ALC Results (1993)

Grade	Area (ha)	Proportion
Subgrade 3a "good"	14.9	30
Subgrade 3b "moderate"	29.4	60
Non-agricultural	1.1	2
Woodland	3.7	8
Total	49.1	100

3.4 The distribution is shown below on an extract from the ALC plan.

Insert 5: Distribution of Grades



4 ALC OF THE NORTHERN PART OF THE SITE

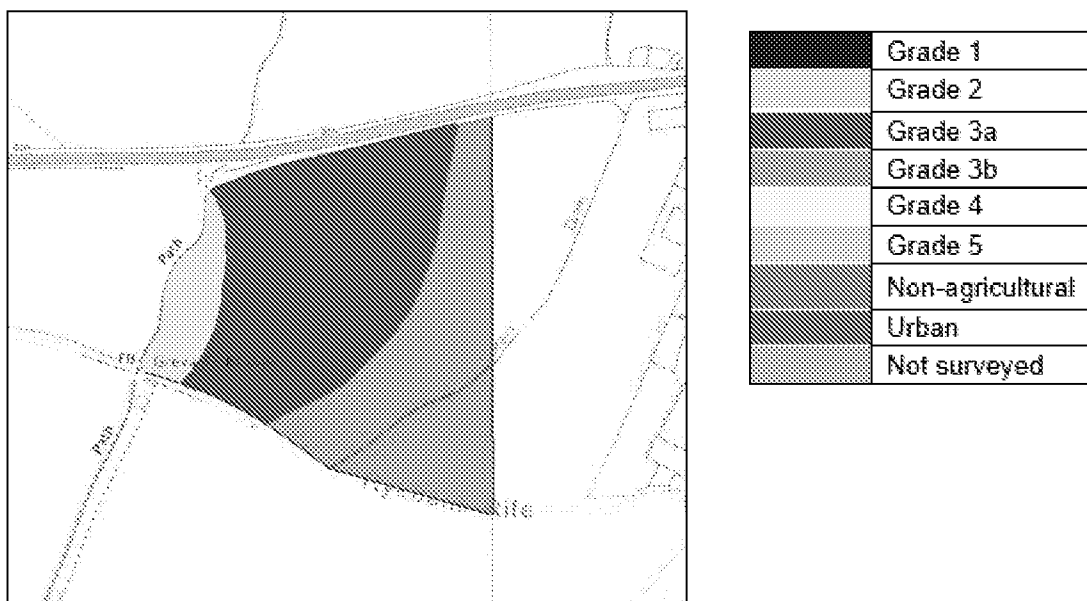
- 4.1 Kernon Countryside Consultants carried out a detailed Agricultural Land Classification of the northern part of the site, extending to 11.6ha.
- 4.2 The ALC methodology, limitations and results are described in detail in **Appendix KCC2**, together with the auger results etc.
- 4.3 The ALC results mapped the site as follows:

Table KCC2: KCC ALC Results (2021)

Grade	Area (ha)	Proportion (%)
Grade 2 “very good”	1.7	15
Grade 3a “good”	6.2	53
Grade 3b “moderate”	3.7	32
Total	11.6	100

- 4.4 The distribution is shown below on an extract from the ALC plan.

Insert 6: Distribution of Grades



- 4.5 The north-western part of the site is unsurveyed. It is shown on the published “provisional” ALC maps as Grade 2 and falls within the “high probability of BMV (>60% area BMV)”.
- 4.6 Additional woodland (5.0 ha) is included to the east of the area surveyed by ADAS and is included in the totals.

5 COMBINED ALC

5.1 Accordingly the combined ALC for the site is as follows.

Table KCC3: Combined ALC for the Site

Grade	Description	Area (ha)	Proportion (%)
2	Very good	1.7	2.2
3a	Good	21.1	27.2
3b	Moderate	33.1	42.6
	Woodland	8.7	11.2
NA	Non-Agricultural	1.1	1.4
N/S	Not surveyed	11.9	15.4
Total		77.6	100

Appendix KCC1
ADAS ALC Report and Plan

4202-131-92

AGRICULTURAL LAND CLASSIFICATION
GOLF COURSE PROPOSAL -
MIDDLETON-ON-SEA BOGNOR REGIS
WEST SUSSEX

January 1993
ADAS Ref 4202/131/92
MAFF Ref EL 42/00155

Resource Planning Team
Guildford Statutory Team
ADAS Reading

AGRICULTURAL LAND CLASSIFICATION

MIDDLETON-ON-SEA, BOGNOR REGIS, WEST SUSSEX

1 Introduction

1.1 In January 1993, an Agricultural Land Classification, (ALC), survey was carried out on 49.1 hectares of land to the north-east of Middleton-on-Sea, West Sussex. ADAS was commissioned by MAFF to determine the quality of land affected by proposals for a change of land use to a golf course.

1.2 The survey was carried out at a detailed scale of one boring per hectare. A total of 44 borings and three soil inspection pits were described in accordance with MAFF's revised guidelines and criteria for grading the quality of agricultural land, (MAFF 1988). These guidelines provide a framework for classifying land according to the extent to which its physical and chemical characteristics impose long term limitations on its agricultural use.

At the time of survey the land was under leguminous crops.

1.3 The distribution of grades is shown on the attached ALC map and the area and extent is given in the table below. The map has been drawn at a scale of 1:5000. It is accurate at this scale but any enlargement would be misleading.

Distribution of Grades and Sub-grades

	<u>Area (ha)</u>	<u>% total agricultural land</u>
Grade 3a	14.9	34
3b	29.4	66
Total agricultural area	<u>44.3</u>	<u>100</u>
Non agricultural	1.1	
Woodland	3.7	
Total area of site	<u>49.1</u>	ha

1.4 The grades and land use categories identified in this survey are described in Appendix 1.

1.5 Grades 3a and 3b have been mapped across the site. The land is primarily limited by wetness and workability arising from the combination of climatic regime (ie a relatively high number of field capacity days) and the occurrence of gleyed and slowly permeable horizons in many of the profiles. The relative depths to these horizons which show evidence of impeded drainage determines the grade, such that the shallower the gleying and slowly permeable horizon, the more severe the wetness limitation and the poorer the land quality.

2 PHYSICAL FACTORS AFFECTING LAND QUALITY

Relief

- 2 1 The site lies at an altitude of 2-3 m AOD and is generally flat or very gently undulating. Nowhere on the site is gradient or altitude a significant limitation to agricultural land quality.

Climate

- 2 2 Estimates of climatic variables relevant to the assessment of agricultural land quality were obtained by interpolation from a 5 km grid dataset (Met Office, 1989) for a representative location in the survey area.

Climatic Interpolation

Grid Reference	SU 008 987
Altitude (m AOD)	3
Accumulated Temperature (°Days, Jan-June)	1524
Average Annual Rainfall (mm)	694
Field Capacity Days	167
Moisture Deficit, wheat (mm)	112
Moisture Deficit, potatoes (mm)	106

- 2 3 There is no overall climatic limitation at this locality. However climatic and soil factors will interact to influence soil wetness and droughtiness limitations. It should be noted that the relatively high number of field capacity days at this locality has particular relevance in the grading of this site.

Geology and Soils

- 2 4 British Geological Survey, Sheet 332, Bognor (1975) shows much of the site to be underlain by Recent and Pleistocene Brickearth deposits which rest on Cretaceous Upper Chalk. A small band of Alluvium has been indicated along the eastern boundary of the site.
- 2 5 Soil Survey of England and Wales Sheet 6 Soils of South East England (1983) indicates the presence of two soil associations on the site. Across the northern part of the site soils of the Parkgate association have been mapped. These are described as 'seasonally waterlogged deep stoneless silty soils' (SSEW, 1984). Soils of the Efford 1 association, 'well drained fine loamy soils' (SSEW, 1984) have been mapped across the southern part of the site.
- 2 6 Detailed field examination of the soils on the site suggests that they are broadly of one type. Typically, non-calcareous clay loam topsoils overlie similar textures in the immediate subsoil and pass to clay in the lower subsoil which may become calcareous. Profiles are assigned to wetness class III or IV, depending on depth to gleying and slowly permeable clay horizons. The majority of the site comprises these surface water gleys although occasional profiles are not slowly permeable, but are affected by groundwater.

3 AGRICULTURAL LAND CLASSIFICATION

3.1 The ALC grading of the survey area is primarily determined by wetness and workability limitations. Grades 3a and 3b have been mapped.

3.2 Grade 3a

Land of this quality occurs as a single mapping unit across the central part of the site and represents 34% of the total agricultural area surveyed.

Profiles typically comprise non-calcareous medium clay loam topsoils overlying heavy clay loam, sandy clay loam or clay in the subsoil. Profiles may be very slightly stony throughout and may become calcareous at depth. Gleying is evident between 29 cm and 55 cm depth and slowly permeable clay horizons were found to occur below 45 cm. Given these drainage characteristics, profiles were assigned to wetness class III and graded 3a good quality agricultural land accordingly.

The land is limited by wetness which means the soil water regime is likely to adversely affect plant growth or impose restrictions on cultivations or grazing by livestock.

3.3 Grade 3b

Land assigned to this grade, moderate quality agricultural land has been mapped across the remaining two-thirds of the site.

The constituent soils are similar to those described above, the differences being that topsoils may be of medium or heavy clay loam and gleyed and slowly permeable horizons occur at shallower depth in the profile. Typically gleying was evident within 40 cm and slowly permeable clay horizons were present within 45 cm. Wetness class IV was assigned to such profiles. Alternatively, occasional profiles were slightly better drained with slowly permeable layers occurring below 45 cm (wetness class III) but were graded 3b on the basis of wetness and workability as a result of heavy clay loam topsoil textures.

This land is subject to significant wetness and workability limitations and may be expected to be difficult to cultivate and capable of producing only moderate yields of a narrow range of crops or high yields of grass.

January 1993
ADAS Ref 4202/131/92
MAFF Ref EL 42/00155

Resource Planning Team
Guildford Statutory Centre
ADAS Reading

SOURCES OF REFERENCE

- British Geological Survey (1975) Sheet 332, Bognor
- MAFF (1988) Agricultural Land Classification of England and Wales
Revised guidelines and criteria for grading the quality of agricultural
land
- Meteorological Office (1989) Climatic datasets for Agricultural Land
Classification
- Soil Survey of England and Wales (1983) Sheet 6, Soils of South-East
England
- Soil Survey of England and Wales (1984) Bulletin 15 Soils and their use
in South-East England

Golf Course Proposal: Middleton-on-Sea, Bognor Regis.

Agricultural Land Classification



AGRICULTURAL LAND			
Grade	Quality	Area	% of Total
Grade 1	excellent	5a	%
Grade 2	very good	5a	%
Grade 3a	good	14,35a	33.4%
Grade 3b	moderate	29,45a	66.6%
Grade 4	poor	5a	%
Grade 5	very poor	5a	%

Total area of agricultural land surveyed 44,25a

Agricultural buildings	5a
Woodland	5a
Not surveyed	5a

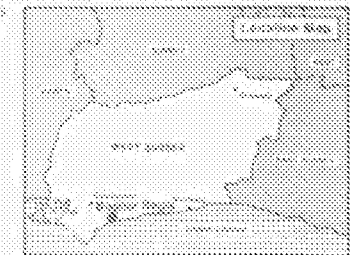
NON-AGRICULTURAL LAND

Land predominantly in urban use	5a
Land in non-agricultural use	5a
Total area of site	49,15a

For further information consult "Agricultural Land Classification in England and Wales (Produce guidelines and criteria for grading the quality of agricultural land)", MAY 1, 1988.

SOURCE MAPS

50 00 50



Surveyed by the Resource Planning Team 1/88.
Map prepared and produced by the Cartographic Unit, Resource Planning Team, Southern Statutory Brown, Agricultural Development and Advisory Service.
Reference no. 4293/131/88 SL 42/88/100
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Appendix KCC2
KCC ALC Report, Plans, Attachments

AGRICULTURAL LAND CLASSIFICATION

Background

1. This section of the report sets out the findings of a detailed Agricultural Land Classification (ALC). It is based on a desktop study of relevant published information on climate, topography, geology and soil, in conjunction with a soil survey. The ALC study area, which measures approximately 11.6 ha in area.

Methodology

2. The work has been carried out by a Chartered Scientist (CSci), who is a Fellow (F. I. Soil Sci) of the British Society of Soil Science (BSSS). This ALC survey has been carried out by a soil scientist who meets the requirements of the BSSS Professional Competency Standard (PSC) scheme for ALC (see BSSS PCS Document 2 'Agricultural Land Classification of England and Wales'. The BSSS PSC scheme is endorsed, amongst others, by the Department for Environment, Food and Rural Affairs (Defra), Natural England, the Science Council, and the Institute of Environmental Assessment and Management (IEMA).
3. This assessment is based upon the findings of a study of published information on climate, geology and soil in combination with a soil investigation carried out in accordance with the Ministry of Agriculture, Fisheries and Food (MAFF) 'Agricultural Land Classification of England and Wales: Revised Guidelines and Criteria for Grading the Quality of Agricultural Land', October 1988 (henceforth referred to as the 'the ALC Guidelines').
4. The ALC system provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. The ALC system divides agricultural land into five grades (Grade 1 'Excellent' to Grade 5 'Very Poor'), with Grade 3 subdivided into Subgrade 3a 'Good' and Subgrade 3b 'Moderate'. Agricultural land classified as Grade 1, 2 and Subgrade 3a falls in the '*best and most versatile*' category in Paragraphs 174 and 175 of the National Planning Policy Framework (NPPF), revised on the 20th July 2021. Further details of the ALC system and national planning policy implications are set out by Natural England in its Technical Information Note 049¹.

¹ Natural England (December, 2012). 'Agricultural Land Classification: protecting the best and most versatile agricultural land (TIN049)'. Available online @ <http://publications.naturalengland.org.uk/publication/35012> Last accessed October 2021

5. A detailed ALC survey was carried out on the 29th September 2021. The survey involved examination of the soil's physical properties at 11 auger bore locations on a 100m by 100m grid, as shown on **Plan KCC3121/01**. One soil pit (Pit 1) was excavated with a spade to examine certain soil physical properties, such as stone content and subsoil structure, in more detail.
6. A sample of topsoil was collected at two auger-bore locations, i.e., 7 and 10, as shown on **Plan KCC3121/01**. The samples were sent to an accredited laboratory for particle size analysis, i.e., the proportions of sand, silt and clay. This is to determine the definitive texture class of the topsoil.
7. The sample locations were located using a hand-held Garmin E-Trec Geographic Information System (GIS) to enable the sample locations to be relocated for verification, if necessary.
8. The soil profile was examined at each sample location to a maximum depth of approximately 1.2 m by hand with the use of a 5 cm diameter Dutch (Edleman) soil auger. The soil profile at each sample location was described using the '*Soil Survey Field Handbook: Describing and Sampling Soil Profiles*' (Ed. J.M. Hodgson, Cranfield University, 1997). Each soil profile was ascribed a grade following the ALC Guidelines.
9. As described in the ALC Guidelines, the main physical factors influencing agricultural land quality are:
 - climate;
 - site;
 - soil; and
 - interactive limitations.
10. These factors are considered in turn below.

Climate

11. Interpolated climate data relevant to the determination of the ALC grade of land at the Site is given in Table 1 below.

Table 1: ALC Climate Data for Bognor Regis, West Sussex

Climate Parameter	Grid Ref: SU 98874 01349
Average Altitude (m)	2
Average Annual Rainfall (mm)	730
Accumulated Temperature above 0°C (January – June)	1447
Moisture Deficit (mm) Wheat	123
Moisture Deficit (mm) Potatoes	120
Field Capacity Days (FCD)	149
Grade according to climate	1

12. Agricultural land quality at the Site is not limited by climate with reference to Figure 1 'Grade according to climate' on page 6 of the ALC Guidelines. In this case, agricultural land at the Site would be Grade 1 without any additional limitations.
13. The soil profiles across the Site are predicted to be at field capacity (i.e., the amount of soil moisture or water content held in the soil after excess water has drained away) for approximately 149 Field Capacity Days (FCD) per year, mainly over the late autumn, winter and early spring. The climate interacts with soil physical properties, i.e., soil texture and wetness class, and can limit agricultural land quality due to soil wetness as per Table 6 of the ALC Guidelines 'Grade according to soil wetness'.

Site

14. The Site is located to the north-east of Bognor Regis, West Sussex. The Site is bordered by Grevatts Lane (A259) to the north, and by watercourses (Ryebank Rife) to the south and west. The approximate centre of the Site is located at British National Grid (BNG) reference SU 98874 01349.
15. With regard to the ALC Guidelines, agricultural land quality can be limited by one or more of three main site factors as follows:
- gradient;
 - micro-relief (i.e., complex change in slope angle over short distances); and
 - risk of flooding.
16. **Gradient and Micro-Relief.** The Site is located on broadly level ground on the West Sussex Coastal Plain. The land has an elevation of approximately 3 metres Above Ordnance Datum (mAOD) at the highest point in the north, and approximately 1 mAOD in the south. The quality of agricultural land over the Site is not limited by gradient, which does not exceed 7°.

17. No part of the Site is limited by micro-relief (i.e., complex changes in slope angle and direction over short distances).
18. **Risk of Flooding.** From the Government Flood Map for Planning website², the Site is located mainly in Flood Zone 3 with a high probability of flooding, apart from some slightly higher land in the north-west corner which is in Flood Zone 1 (i.e., low probability of flooding). However, there are no records (data) to show that agricultural land in any part of the Site is limited by flooding, according to the criteria for frequency and/or duration in Table 2 '*Grade according to flood risk in summer*' and/or Table 3 '*Grade according to flood risk in winter*' of the ALC Guidelines.

Soil

19. **Geology/Soil Parent Material.** From British Geological Survey (BGS) maps at 1:50,000 scale, the land at the Site is mainly underlain entirely by chalk in the Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (undifferentiated; chalk). The bedrock is entirely covered by River Terrace Deposits (sand, silt and clay).
20. **Published Information on Soil.** Soil information is available at a small scale (1:250,000) on the National Soil Map published by the Soil Survey of England and Wales (SSEW) in 1983. This provisional soil map indicates that land at the Site is covered soils grouped in the Hamble 2 and Park Gate Associations. A more detailed SSEW soil map (1:25,000) of the West Sussex Coastal Plain published in 1967 shows the Site is covered by soils in the Park Gate Series; with Park Gate soils in a deep phase in the north (PZ1), and a shallow phase with a calcareous C horizon (PZ4) in the south.
21. As described by the SSEW, the Hamble 2 Association consists deep, stoneless silty soils. This Association is mostly on low-lying land and soils are permeable and well drained (Wetness Class I), although the latter may require pipe drainage in some places where the silty drift thins over seasonally waterlogged gravels.
22. The Park Gate Association consists of consists of deep stoneless silty soils. These soils have grey and ochreous mottled subsoil colours and are moderately permeable (Wetness Class III or IV) and affected by high winter water-tables; resulting in seasonal waterlogging.

² Government Flood Map for Planning website. Available online @ <https://flood-map-for-planning.service.gov.uk/> Last accessed October 2021

23. **Soil Survey.** The detailed soil survey carried out on the 29th September 2021 determined two main types of soil, which are similar to those described by the SSEW as belonging to the Park Gate Association, as follows.

Type 1

24. Type 1 soil profiles consist of, non-calcareous, dark greyish brown (Munsell Colour 10R4/2), very slightly stony (1%-2% hard gravels) medium sandy silt loam or medium silty clay loam topsoil over non-calcareous, brown (10YR5/3), stoneless, medium to heavy silty clay loam upper subsoil. The lower subsoil is similar to the upper subsoil but has common, distinct mottles (i.e., ochreous mottles of 7.5YR5/8, and greyish mottles of 2.5Y5/2 to 6/2) and many concretions of manganese. The soil profiles are slowly permeable and seasonally waterlogged (Wetness Class III).

Type 2

25. Type 2 soil profiles consist of, slightly calcareous, dark greyish brown (Munsell Colour 10R4/2), very slightly stony (1%-2% hard gravels), medium to heavy silty clay loam topsoil over medium to very calcareous, greyish brown (10YR5/2), stoneless, medium to heavy silty clay loam upper subsoil. The lower subsoil is similar to the upper subsoil but is light olive brown in colour (2.5Y5/3) and has common, distinct mottles (i.e., ochreous mottles of 7.5YR5/8, and greyish mottles of 2.5Y5/2 to 6/2) and many concretions of manganese. The soil profiles are slowly permeable and seasonally waterlogged (Wetness Class III).
26. A log of all the soil profiles recorded on site is given as **Attachment A**. One soil pit (Pit 1) was excavated near auger-bore 11 with a spade to examine certain soil physical properties, such as subsoil structure, in more detail. A description of the soil pit is given as **Attachment B**.
27. In order to substantiate topsoil texture determined during the ALC survey by hand-texturing, two samples of topsoil were collected over the Site (i.e., auger locations 7 and 10, Figure 1). The topsoil sample was sent to an accredited laboratory for analysis of particle size distribution (PSD), based on the British Standard Institution particle size grades. The certificate of analysis is provided as **Attachment C**. The findings of the PSD analysis are shown in Table 2 below.

Table 2: Topsoil Texture (re Table 10, ALC Guidelines)

Topsoil Sample Location (See Plan KCC3121/01)	% sand 0.063-2.0 mm*	% silt 0.002- 0.063 mm	% clay <0.002 mm	ALC Soil Texture Class
AB7	23	60	17	Medium Sandy Silt Clay
AB10	20	52	28	Medium Silty Clay Loam

Interactive Limitations

28. From the information above, together with the findings of the detailed soil survey (see Soil Profile Log given as **Attachment A**), it has been determined that the quality of agricultural land over the Site is limited mainly by soil wetness. Some of the profiles which are only slightly seasonally waterlogged (Wetness Class II) during the wettest months of the year in the Autumn, Winter and early Spring are also limited by slight soil droughtiness (i.e., a shortage of water held in the soil) during the growing season, as described below.
29. **Soil Wetness.** From the ALC Guidelines, a soil wetness limitation exists where *'the soil water regime adversely affects plant growth or imposes restrictions on cultivations or grazing by livestock'*. Agricultural land quality at the Site is limited by soil wetness as per Table 3 below (based on Table 6 'Grade According to Soil Wetness – Mineral Soils' in the ALC Guidelines).

Table 3: ALC Grade According to Soil Wetness

Wetness Class	Texture of the Top 25 cm	126-175 Field Capacity Days
III	Sand, Loamy Sand, Sandy Loam, Sandy Silt Loam Sandy Clay Loam/Medium Silty Clay Loam /Medium Clay Loam* Heavy Silty Clay Loam/Heavy Clay Loam** Sandy Clay/Silty Clay/Clay	2 3a (2) 3b (3a) 3b (3a)
Key * 18% to <27% clay; and ** 27% to 35% clay () brackets show grade uplift for naturally calcareous soils with more than 1% calcium carbonate and between 18%-50% clay in the top 25cm of soil		

30. In a climate area with 149 FCD, soil profiles which are slowly permeable and seasonally waterlogged (Wetness Class III) are limited by soil wetness as follows:
- (i) profiles with non-calcareous, medium sandy silt loam topsoil are limited by soil wetness to Grade 2;
 - (ii) profiles with non-calcareous medium silty clay loam topsoil are limited by soil wetness to Subgrade 3a;
 - (iii) profiles with calcareous heavy silty clay loam topsoils are limited by soil wetness to Subgrade 3b.
31. **Soil Droughtiness.** From the ALC Guidelines, a soil droughtiness limitation exists 'in areas with relatively low rainfall or high evapotranspiration, or where the soil holds only small reserves of moisture available to plant roots.' The ALC grade according to soil droughtiness is shown in Table 4 below (based on Table 8 'Grade According to Droughtiness' in the ALC Guidelines). To be eligible for Grades 1 to 3b the moisture

balances (MBs) must be equal to, or exceed, the stated minimum values for both wheat and potatoes. If the MB for either crop is less (i.e., more negative) than that shown for Subgrade 3b, the soil is Grade 4 on droughtiness).

Table 4: ALC Grade According to Soil Droughtiness

Grade/Subgrade	Moisture Balance (MB) Limits (mm)	
	Wheat	Potatoes
1	+30	+10
2	+5	-10
3a	-20	-30
3b	-50	-55
4	<-50	<-55

- 32 The grade according to soil droughtiness per auger log is shown in **Attachment A**. Some Type 1 soil profiles with medium sandy silt loam topsoil are slightly limited by soil droughtiness to Grade 2 during the growing season.

ALC Grading at the Site

- 33 The area and proportion of agricultural land in each ALC grade has been measured from an ALC map given as **Plan KCC3121/02**. The findings are reported in Table 2.5 below.
- 34 By detailed ALC survey, it has been determined that the quality of agricultural land at the Site with clay over medium to heavy clay subsoil (Wetness Class I, IV) is mainly limited by soil wetness to Grade 2 and Subgrade 3a.

Table 5: Agricultural Land Classification – Bognor Regis, West Sussex

ALC Grade	Area (Ha)	Area (% of Total Site)
Grade 1 (Excellent)	0	0
Grade 2 (Very Good)	1.7	15
Subgrade 3a (Good)	6.2	53
Subgrade 3b (Moderate)	3.7	32
Grade 4 (Poor)	0	0
Grade 5 (Very Poor)	0	0
Non-agricultural / Other land	0	0
Total	11.6	100

Attachment A
Soil Profile Log

Soil Survey				Surveyor	RA
Easting (X)	498900	Northing (Y)	101200	Alt (m)	1
Land Use	Reference	11 (N/A)	Slope °	≤7	Grid Reference SU 98900 01200
Bedrock	Lewes Nodular Chalk Formation	Superficial	River Terrace Deposits	Aspect	S
				Date	20/09/2021

Layer		Topsoil	2	3	4	5	6	7
Lower Depth (cm)		26	40	120				
Texture		MZCL - Silty clay	HZCL - Silty clay loam (heavy)	ZC - Silty clay				
Matrix Colour		10YR4/2	10YR5/2	10YR6/4				
Gley (Y/N)		No	Yes	Yes				
Ochreous Mottles	Form		CD - Common Distinct	CD - Common Distinct				
	Munsell Colour		7.5YR5/8	7.5YR5/8				
Grey Mottles	Form		CD - Common Distinct	CD - Common Distinct				
	Munsell Colour		2.5Y6/2	2.5Y5/2				
Manganese (Y/N)		No	No	Yes				
% Stones (type 1)		1	0	0				
Stones > 2cm		0						
Stones > 6cm		0						
Stone Type		GH - Gravel with	GH - Gravel with non-pore	GH - Gravel with non-porous (hard) stones				
% Stones (type 2)								
Stones > 2cm								
Stones > 6cm								
Stone Type								
CaCO ₃		NON - Non-calcareous	SC - Slightly calcareous (<10% CaCO ₃)	VC - Very calcareous (>10% CaCO ₃)				
Shape of Peds		SAB - Subangular	SAB - Subangular Blocky	AB - Angular Blocky				
Size of Peds		F - Fine	M - Medium	C - Coarse				
Subsoil Structure		Not Applicable	Moderate	Poor				
Soil or Ped. Strength		Friable	Firm	Firm				
Degree of Ped. Development		M - Moderate	M - Moderate	W - Weak				
Slowly Permeable Layer (Y/N)		No	No	Yes				

MDw	MDp	FCD
123	120	149

Wetness	Class (WC)	WC III
	Grade (WE)	3b

Notes	
-------	--

Attachment B
Soil Pit Description

Point	Grid ref.			Alt (m)	Slope *	Aspect	Depth (cm)			Matrix	Ochreous Mottles		Grey Mottles		Gley	Texture	Stones - type 1					SUBS STR	CaCO3	Mn C	SPL	Droug ght			Wet		Final ALC		
	NGR	X	Y				Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	> 2cm	> 6cm	Type					MBw	MBp	Gd	WC	Gw	Limitation 1	Limitation 2	Grade	
1	SU 98800 01500	498800	1E+05	3	≤7	S	0	18	18	10YR4/2	CD - Common Distinct	10YR5/8	CD - Common Distinct	2.5Y7/2	Yes	MZCL - Silty clay loam (medium)	2	1	0	GH - Gravel with non-porous (hard) stones	Not Applicable	NON - Non-calcareous (<0.5% CaCO3)	No	No	9	-4	2	WC III	3a	Wetness		3a	
							18	35	17	10YR5/2	CD - Common Distinct	10YR4/4			Yes	MZCL - Silty clay loam (medium)	2			GH - Gravel with non-porous (hard) stones	Moderate	NON - Non-calcareous (<0.5% CaCO3)	Yes	No									
							35	60	25	10YR6/3	CD - Common Distinct	10YR5/4			CD - Common Distinct	2.5Y4/4		HZCL - Silty clay loam (heavy)	2			GH - Gravel with non-porous (hard) stones	Moderate	NON - Non-calcareous (<0.5% CaCO3)	Yes	No							
							60	120	60	10YR6/4	CD - Common Distinct	10YR5/8			CD - Common Distinct	2.5Y4/4		HZCL - Silty clay loam (heavy)	2			GH - Gravel with non-porous (hard) stones	Poor	NON - Non-calcareous (<0.5% CaCO3)	Yes	Yes							
2	SU 98900 01500	498900	1E+05	3	≤7	S	0	30	30	10YR4/2			CD - Common Distinct	2.5Y6/2	No	MZCL - Silty clay loam (medium)	2	1	0	GH - Gravel with non-porous (hard) stones	Not Applicable	NON - Non-calcareous (<0.5% CaCO3)	No	No	19	-1	2	WC III	3a	Wetness		3a	
							30	60	30	10YR5/3	CD - Common Distinct	7.5YR5/8			Yes	HZCL - Silty clay loam (heavy)	0			GH - Gravel with non-porous (hard) stones	Moderate	NON - Non-calcareous (<0.5% CaCO3)	No	No									
							60	120	60	10YR6/4	CD - Common Distinct	7.5YR5/8			CD - Common Distinct	2.5Y5/2	Yes	ZC - Silty clay	0			GH - Gravel with non-porous (hard) stones	Poor	NON - Non-calcareous (<0.5% CaCO3)	Yes	Yes							
3	SU 99000 01500	499000	1E+05	3	≤7	S	0	30	30	10YR4/2			CD - Common Distinct	2.5Y6/2	No	MZCL - Silty clay loam (medium)	0	0	0	GH - Gravel with non-porous (hard) stones	Not Applicable	NON - Non-calcareous (<0.5% CaCO3)	No	No	12	-10	2	WC III	3b	Wetness		3b	
							30	40	10	10YR5/2	CD - Common Distinct	7.5YR5/8			Yes	HZCL - Silty clay loam (heavy)	0			GH - Gravel with non-porous (hard) stones	Moderate	SC - Slightly calcareous (1- 5% CaCO3)	No	No									
							40	120	80	10YR6/4	CD - Common Distinct	7.5YR5/8			Yes	ZC - Silty clay	0			GH - Gravel with non-porous (hard) stones	Poor	VC - Very calcareous (>10% CaCO3)	Yes	Yes									

4	SU 98700 01400	498700	1E+05	2	±7	S	0	30	30	10YR4/2				No	MSZL - Medium sandy silt loam	2	2	0	GH - Gravel with non-porous (hard) stones	Not Applicable	NON - Non-calcareous (<0.5% CaCO3)	No	No	16	-6	2	WC III	2	Droughtiness	Wetness	2	
							30	50	20	10YR5/3	CD - Common Distinct	7.5YR5/8	CD - Common Distinct	2.5Y6/2	Yes	HZCL - Silty clay loam (heavy)	0			GH - Gravel with non-porous (hard) stones	Moderate	NON - Non-calcareous (<0.5% CaCO3)	No	No								
							50	120	70	10YR6/4	CD - Common Distinct	7.5YR5/8	CD - Common Distinct	2.5Y5/2	Yes	ZC - Silty clay	0			GH - Gravel with non-porous (hard) stones	Poor	NON - Non-calcareous (<0.5% CaCO3)	Yes	Yes								
5	SU 98800 01400	498800	1E+05	2	±7	S	0	30	30	10YR4/2				No	MZCL - Silty clay loam (medium)	2	0	0	GH - Gravel with non-porous (hard) stones	Not Applicable	NON - Non-calcareous (<0.5% CaCO3)	No	No	17	-4	2	WC III	3a	Wetness		3a	
							30	54	24	10YR5/3	CD - Common Distinct	7.5YR5/8	CD - Common Distinct	2.5Y6/2	Yes	HZCL - Silty clay loam (heavy)	0			GH - Gravel with non-porous (hard) stones	Moderate	NON - Non-calcareous (<0.5% CaCO3)	No	No								
							54	120	66	10YR6/4	CD - Common Distinct	7.5YR5/8	CD - Common Distinct	2.5Y5/2	Yes	ZC - Silty clay	0			GH - Gravel with non-porous (hard) stones	Poor	SC - Slightly calcareous (1 - 5% CaCO3)	Yes	Yes								
6	SU 98900 01400	498900	1E+05	1	±7	S	0	32	32	10YR4/2				No	MZCL - Silty clay loam (medium)	1	0	0	GH - Gravel with non-porous (hard) stones	Not Applicable	NON - Non-calcareous (<0.5% CaCO3)	No	No	18	-3	2	WC III	3a	Wetness		3a	
							32	54	22	10YR5/3	CD - Common Distinct	7.5YR5/8	CD - Common Distinct	2.5Y6/2	Yes	HZCL - Silty clay loam (heavy)	0			GH - Gravel with non-porous (hard) stones	Moderate	NON - Non-calcareous (<0.5% CaCO3)	No	No								
							54	120	66	10YR6/4	CD - Common Distinct	7.5YR5/8	CD - Common Distinct	2.5Y5/2	Yes	ZC - Silty clay	0			GH - Gravel with non-porous (hard) stones	Poor	SC - Slightly calcareous (1 - 5% CaCO3)	Yes	Yes								
7	SU 98700 01300	498700	1E+05	2	±7	S	0	33	33	10YR4/2				No	MSZL - Medium sandy silt loam	2	2	0	GH - Gravel with non-porous (hard) stones	Not Applicable	NON - Non-calcareous (<0.5% CaCO3)	No	No	16	-6	2	WC III	2	Droughtiness	Wetness	2	
							33	50	17	10YR5/3	CD - Common Distinct	7.5YR5/8	CD - Common Distinct	2.5Y6/2	Yes	HZCL - Silty clay loam (heavy)	0			GH - Gravel with non-porous (hard) stones	Moderate	NON - Non-calcareous (<0.5% CaCO3)	No	No								
							50	120	70	10YR6/4	CD - Common Distinct	7.5YR5/8	CD - Common Distinct	2.5Y5/2	Yes	ZC - Silty clay	0			GH - Gravel with non-porous (hard) stones	Poor	NON - Non-calcareous (<0.5% CaCO3)	Yes	Yes								

8	SU 98800 01300	498800	1E+05	2	≤7	S	0	30	30	10YR4/2				No	MZCL - Silty clay loam (medium)	1	0	0	GH - Gravel with non-porous (hard) stones	Not Applicable	NON - Non-calcareous (<0.5% CaCO3)	No	No	16	-6	2	WC III	3a	Wetness	3a
							30	50	20	10YR5/3	CD - Common Distinct	7.5YR5/8	CD - Common Distinct	2.5Y6/2	Yes	HZCL - Silty clay loam (heavy)	0			GH - Gravel with non-porous (hard) stones	Moderate	NON - Non-calcareous (<0.5% CaCO3) SC - Slightly calcareous (1 - 5% CaCO3)	No	No						
							50	120	70	2.5Y5/2	CD - Common Distinct	7.5YR5/8	CD - Common Distinct	2.5Y6/1	Yes	ZC - Silty clay	0			GH - Gravel with non-porous (hard) stones	Poor		Yes	Yes						
9	SU 98900 01300	498900	1E+05	1	≤7	S	0	32	32	10YR4/2				No	HZCL - Silty clay loam (heavy)	1	0	0	GH - Gravel with non-porous (hard) stones	Not Applicable	NON - Non-calcareous (<0.5% CaCO3)	No	No	18	-3	2	WC III	3b	Wetness	3b
							32	54	22	10YR5/3	CD - Common Distinct	7.5YR5/8	CD - Common Distinct	2.5Y6/2	Yes	HZCL - Silty clay loam (heavy)	0			GH - Gravel with non-porous (hard) stones	Moderate	SC - Slightly calcareous (1 - 5% CaCO3)	No	No						
							54	120	66	10YR6/4	CD - Common Distinct	7.5YR5/8	CD - Common Distinct	2.5Y5/2	Yes	ZC - Silty clay	0			GH - Gravel with non-porous (hard) stones	Poor	VC - Very calcareous (>10% CaCO3)	Yes	Yes						
10	SU 98810 01200	498810	1E+05	1	≤7	S	0	28	28	10YR4/2				No	MZCL - Silty clay loam (medium)	1	0	0	GH - Gravel with non-porous (hard) stones	Not Applicable	NON - Non-calcareous (<0.5% CaCO3)	No	No	11	-11	3a	WC III	3b	Wetness	3b
							28	40	12	10YR5/3	CD - Common Distinct	7.5YR5/8	CD - Common Distinct	2.5Y6/2	Yes	HZCL - Silty clay loam (heavy)	0			GH - Gravel with non-porous (hard) stones	Moderate	SC - Slightly calcareous (1 - 5% CaCO3)	No	No						
							40	120	80	10YR6/4	CD - Common Distinct	7.5YR5/8	CD - Common Distinct	2.5Y5/2	Yes	ZC - Silty clay	0			GH - Gravel with non-porous (hard) stones	Poor	VC - Very calcareous (>10% CaCO3)	Yes	Yes						
11	SU 98900 01200	498900	1E+05	1	≤7	S	0	26	26	10YR4/2				No	MZCL - Silty clay loam (medium)	1	0	0	GH - Gravel with non-porous (hard) stones	Not Applicable	NON - Non-calcareous (<0.5% CaCO3)	No	No	11	-11	3a	WC III	3b	Wetness	3b
							26	40	14	10YR5/2	CD - Common Distinct	7.5YR5/8	CD - Common Distinct	2.5Y6/2	Yes	HZCL - Silty clay loam (heavy)	0			GH - Gravel with non-porous (hard) stones	Moderate	SC - Slightly calcareous (1 - 5% CaCO3)	No	No						
							40	120	80	10YR6/4	CD - Common Distinct	7.5YR5/8	CD - Common Distinct	2.5Y5/2	Yes	ZC - Silty clay	0			GH - Gravel with non-porous (hard) stones	Poor	VC - Very calcareous (>10% CaCO3)	Yes	Yes						

Attachment C
Certificate of Analysis



TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD
DATE ISSUED: 13/10/2021



Contract	Bognor Regis, West Sussex		
Serial No.	39500_1		
Client:	Kernon Countryside Consultants Limited Greenacres Barn, Stoke Common Lane, Purton Stoke, Swindon SN5 4LL Soil Property Testing Ltd 15, 16, 18 Halcyon Court, St Margaret's Way, Stukeley Meadows, Huntingdon, Cambridgeshire, PE29 6DG		
Samples Submitted By:	Approved Signatories:		
Kernon Countryside Consultants Limited	☒ J.C. Garner B.Eng (Hons) FGS Technical Director & Quality Manager ☐ W. Johnstone Materials Lab Manager ☐ D. Sabnis Operations Manager		
Samples Labelled:			
Bognor Regis, West Sussex			
Date Received:	04/10/2021	Samples Tested Between:	04/10/2021 and 13/10/2021
Remarks:	For the attention of Sarah Kernon Your Reference No: KCC3121		
Notes:	1. All remaining samples or remnants from this contract will be disposed of after 21 days from today, unless we are notified to the contrary. 2. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. 3. Tests marked "NOT UKAS ACCREDITED" in this test report are not included in the UKAS Accreditation Schedule for this testing laboratory. 4. This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory. 5. The results within this report only relate to the items tested or sampled.		



TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD
DATE ISSUED: 13/10/2021



0998

Contract		Bognor Regis, West Sussex										
Serial No.		39500_1					Target Date		18/10/2021			
Scheduled By		Kernon Countryside Consultants Limited										
Schedule Remarks												
Bore Hole No.	Type	Sample Ref.	Top Depth	Particle Size Distribution (BS3377)								Sample Remarks
AP10	Q	-	1									
AP7	Q	-	1									
Totals			2									End of Schedule



TEST REPORT

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0998

Contract	Bognor Regis, West Sussex																																																																																
Serial No.	39500_1																																																																																
DETERMINATION OF PARTICLE SIZE DISTRIBUTION																																																																																	
Borehole / Pit No.	Depth (m)	Sample		Description	Remarks																																																																												
		Type	Reference																																																																														
AP10		D	-	Firm brown slightly gravelly slightly sandy silty CLAY with frequent recently active roots. Gravel is fine to medium angular to subrounded chalk and chert.																																																																													
Method of Test:		Hydrometer + Pre-sieve		Method of Pretreatment:	Not required																																																																												
<table border="1"> <thead> <tr> <th>CLAY</th> <th>Fine</th> <th>Medium</th> <th>Coarse</th> <th>Fine</th> <th>Medium</th> <th>Coarse</th> <th>Fine</th> <th>Medium</th> <th>Coarse</th> <th>COBBLES</th> <th>BOULDERS</th> </tr> </thead> <tbody> <tr> <td></td> <td colspan="3">SILT</td> <td colspan="3">SAND</td> <td colspan="3">GRAVEL</td> <td></td> <td></td> </tr> </tbody> </table>						CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS		SILT			SAND			GRAVEL																																																								
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Particle Size (mm)	Passing (%)	Silt by Dry Mass (%)	Clay by Dry Mass (%)	Sieve Size (mm)	Passing (%)											Sand by Dry Mass (%)	Sieve Size (mm)			Passing (%)	2mm+ By Dry Mass (%)																																																												
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Method of Preparation: BS1377: Part 1: 2016: 6.3 & 8.4.5 Method of test: BS1377: Part 2: 1990: 9.2,9.5 Type of Sample Key: U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter Comments:																																																																																	



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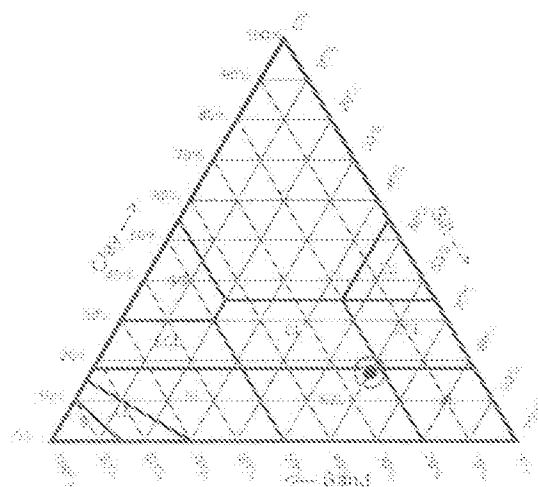
Soil Texture Triangle

Particle size class estimator

Here is a tool that allows you to estimate the particle size class of a soil sample from the proportions of sand, silt and clay. The estimator is based on the texture class intervals of the Soil Survey of England and Wales - note that other international standards also exist, such as the [USDA](#) and [FAO](#) triangles.

Enter soil sample proportions:

Clay (%) Sand (%) Silt (%)



Soil sample is a Sandy Silt Loam

INFOBAR

Soils Site Reporter

Download full [site-specific soil reports](#) for your neighbourhood, development site, farm, wildlife sanctuary, etc.

Soilscapes Viewer

Our free online simplified [interactive soil map](#) for England and Wales.

Soils Guide

An [Online Guide](#) to the Soils of England and Wales.

Case Studies

See examples of how LandIS is being used.

FAQ

Answers to [frequently asked questions](#).

News

- » [Soilscapes Mobile App v1.2.1 launched January 18 2018](#)
- » [Easy access to Soils data January 8 2018](#)
- » [University wins fifth Queen's Anniversary Prize December 1 2017](#)
- » [Design, Development and Impact of the soil educational website Soil-Net.com October 24 2017](#)
- » [Developments in land information systems: examples demonstrating land resource management capabilities and options October 23 2017](#)
- » [New Soil Site Reports May 4 2017](#)
- » [Feeding the nine billion February 2017](#)
- » [Soil Site Reporter - Upgraded January 12 2017](#)
- » [Radio 4 Interview on Farming Today January 12 2017](#)

[See all news ...](#)



TEST REPORT

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Method of Test:		Hydrometer + Pre-sieve		Method of Pretreatment:	Not required																																																																																																																																																																																															
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Method of Preparation: BS1377: Part 1: 2016: 8.3 & 8.4.5 Method of test: BS1377: Part 2: 1990: 9.2, 9.5 Type of Sample Key: U=Undisturbed, B=Bulk, D=Disturbed, L=Lar, W=Water, SPT=Split Spoon Sample, C=Cone Cutter Comments:																																																																																																																																																																																																				

Tools and utilities

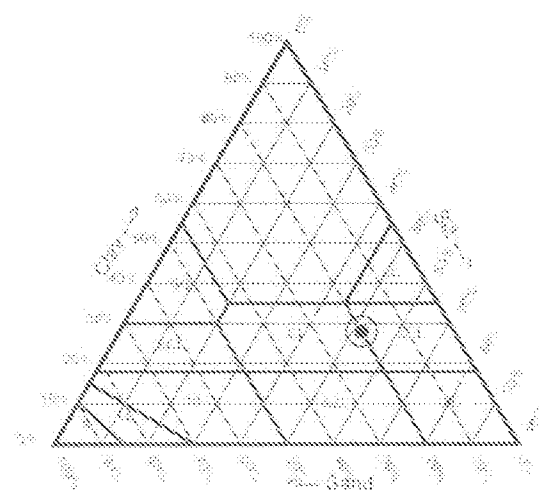
Soil Texture Triangle

Particle size class estimator

Here is a tool that allows you to estimate the particle size class of a soil sample from the proportions of sand, silt and clay. The estimator is based on the texture class intervals of the Soil Survey of England and Wales - note that other international standards also exist, such as the [USDA](#) and [FAO](#) triangles.

Enter soil sample proportions:

Clay (%)	X	Sand (%)	X	Silt (%)	X	• Calculate	Calculate	*
28		20		52				



Soil sample is a Silty Clay Loam

Boys' Sex Reporter

Download full site-specific
soil reports for your
neighbourhood,
development site, farm,
wildlife sanctuary etc.

Seisacres Viewer

Our free online simplified
interactive soil map for
England and Wales

Table 2

An Unrivalled Guide to the Soils
of England and Wales.

Case Studies

See examples of how
LandIS is being used.

F&O

Answers to frequently asked questions

3333

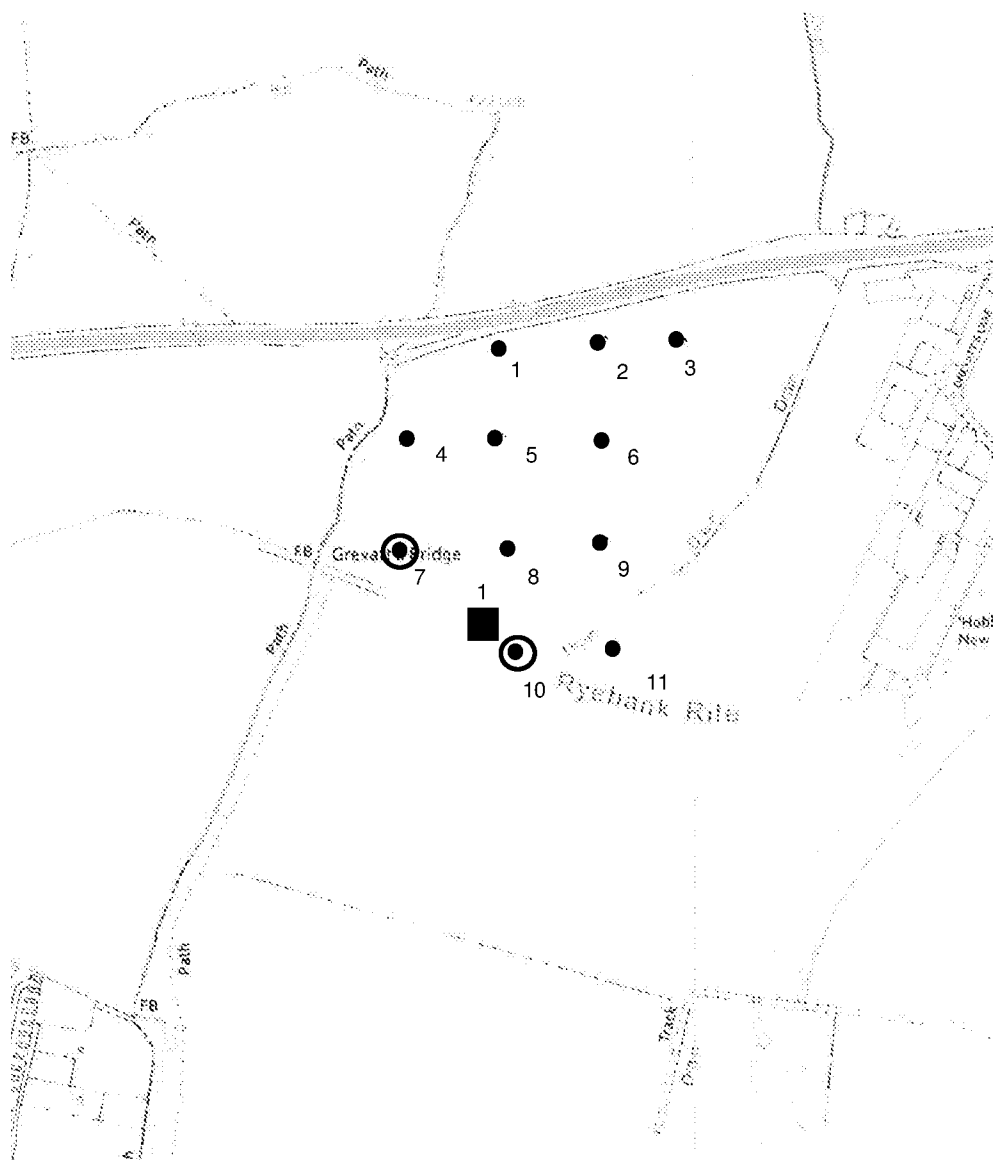
- * Soilscapes Mobile App v1.2.1 launched January 18 2018
- * Easy access to Soils data January 8 2018
- * University wins fifth Queen's Anniversary Prize December 1 2017
- * Design, Development and Impact of the soil educational website Soil-Net.com October 24 2017
- * Developments in land information systems, examples demonstrating land resource management capabilities and outcomes October 23 2017
- * New Soil Site Reports: May 4 2017
- * Feeding the nine billion: February 2017
- * Soil Site Reporter - Upgrade January 13 2017
- * Radio 4 interview on Farming Today January 17 2017

[See all news...](#)

www.landis.org.uk/services/tools.cfm

15

Plan KCC3121/01
Auger Point Plan

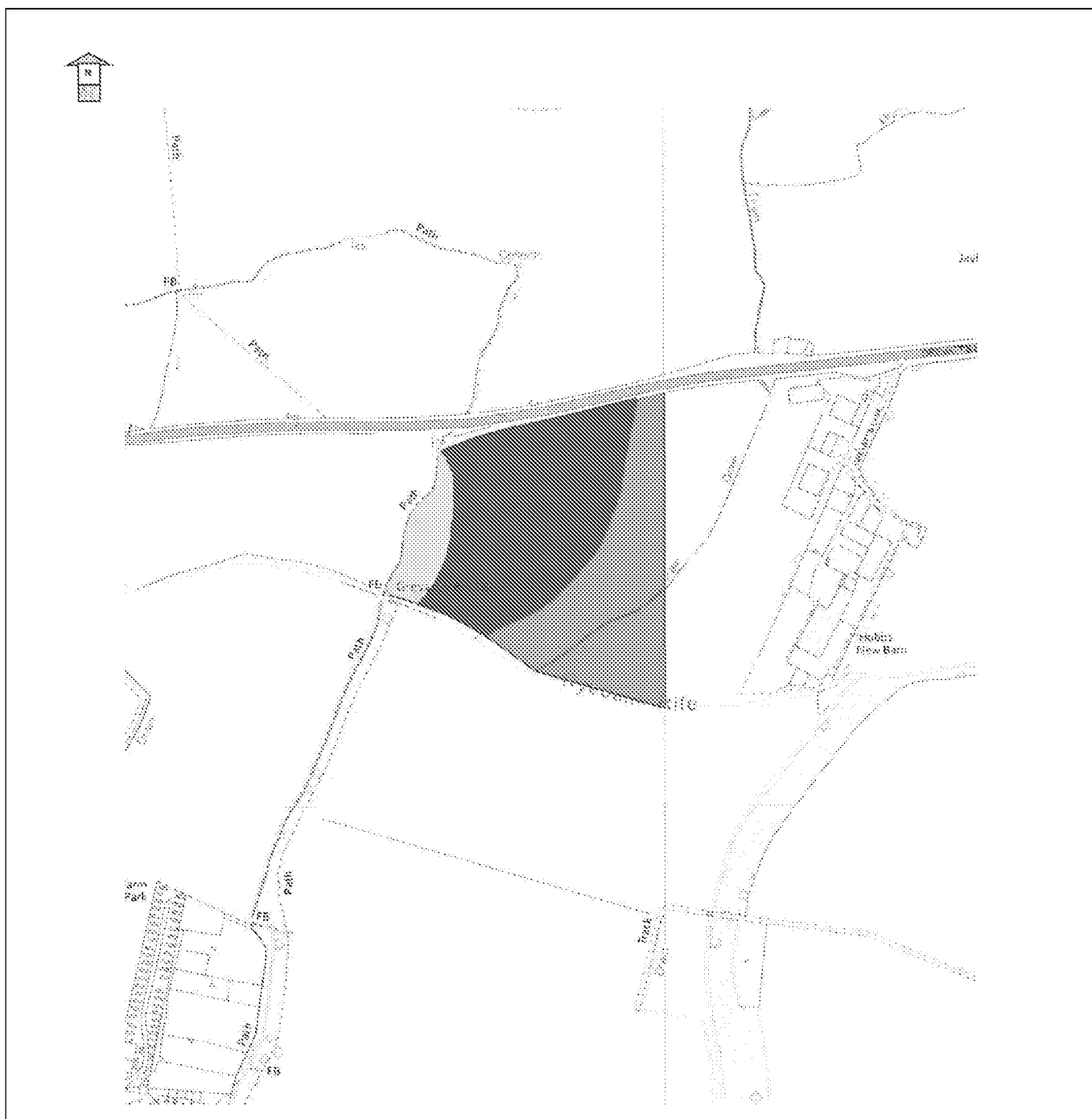


KEY

- Auger sample location
- Topsoil texture sample
- Soil Pit

PLAN	KCC3121/01		
TITLE	Auger Points Plan		
SITE	Land North of Ancton		
CLIENT	Hallam Land Management Ltd		
NUMBER	KCC3121/01 10/21hr		
DATE	October 2021	SCALE	NTS
KERNON COUNTRYSIDE CONSULTANTS LTD GREENACRES BARN, PURTON STOKE, SWINDON, WILTSHIRE SN5 4LL Tel 01793 771 333 Email: info@kernon.co.uk This plan is reproduced from the Ordnance Survey under copyright license 100015226			

Plan KCC3121/02
Agricultural Land Classification Plan



KEY		Ha	%	PLAN	KCC3121/02
	Grade 1			TITLE	Agricultural Land Classification Plan
	Grade 2	1.7	15	SITE	Land North of Ancton
	Grade 3a	6.2	53	CLIENT	Hallam Land Management Ltd
	Grade 3b	3.7	32	NUMBER	KCC3121/02 10/21
	Grade 4			DATE	October 2021
	Grade 5			SCALE	NTS
	Non-agricultural			KERNON COUNTRYSIDE CONSULTANTS LTD GREENACRES BARN, PURTON STOKE, SWINDON, WILTSHIRE, SN5 4LL Tel 01793 771 333 Email: info@kernon.co.uk This plan is reproduced from the Ordnance Survey under copyright license 100015226	
	Urban				
	Not surveyed				

