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PHYSICAL CHARACTERISTICS REPORT INCORPORATING
AGRICULTURAL LAND CLASSIFICATION

LAND AT WENSOR CASTLE FARM, MARKET DEEPING, LINCS

1.0 INTRODUCTION

1.1 A Soil and Agricultural Land Classification (ALC) survey was carried out over 29.5 ha of land at Wensor Castle Farm, Market Deeping, Lincolnshire in connection with a planning application to extract gravel for use on the A16 Spalding by-pass.

1.2 The site is located to the north east of Market Deeping and to the west of the A16 road at Wensor Castle Farm. It is surrounded on all sides by open agricultural land, with a track running down its western side and a deep drain on the eastern boundary. The whole site is in agricultural use and at the time of survey, part was already sown to winter cereals whilst the remainder had undergone autumn cultivations.

1.3 A total of 32 observations were made using a dutch auger to a depth of 1.2 m unless prevented by impenetrable material. In addition two soil pits were dug to help assess subsoil conditions in greater detail.

1.4 On the published Provisional ALC map, sheet number 123 (MAFF, 1963), the site is shown as predominantly Grade 2 with a small area of Grade 3 at the southern end. This map is however of a reconnaissance nature and the current survey was undertaken to provide more detail for the site.

2.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

2.1 Climatic information for the site has been interpolated from the 5 km grid dataset produced by the Meteorological Office (Met Office 1989). The average annual rainfall for the site is 568 mm and the number of days that the soils are likely to be at field capacity is 101.

2.2 The accumulated temperature for the area is approximately 1447 degrees Celsius. This parameter indicates the cumulative build up of warmth available for crop growth and in conjunction with rainfall has an influence on the development of soil moisture deficits and susceptibility to drought. The moisture deficits for wheat and potatoes on this site are 121 mm and 116 mm respectively.

2.3 There is no overall climatic limitation to the agricultural use of the land.

Relief

2.4 The site is predominantly flat with some very minor undulations. A deep ditch runs down the eastern boundary and the site is traversed by a shallower ditch toward its southern end. The altitude of the land is approximately 4 m AOD. Relief therefore does not constitute a limitation to the agricultural grading of the site.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The land has been classified in accordance with the guidelines of the Agricultural Land Classification of England and Wales (MAFF, 1988). A breakdown of the individual grades is given below:

Grade	Area (ha)	%
2	4·5	15
3a	6·8	23
3b	18·2	62
TOTAL	29·5	100

Grade 2

3.2 The southern end of the site has been classified as Grade 2, due to a minor wetness limitation and also a slight droughtiness restriction. This area corresponds to the soils mapped as Soil Type I which are described in paragraph 4.5 These soils despite the evidence of mottling in the subsoil have been classified as Wetness Class I due to the presence of coarse pores in the subsoil, and consequently the mottling is considered to be a relic of former drainage conditions. However due to the heavy textured topsoil there will still be a minor wetness and workability limitation during the wetter periods of the year.

3.3 Conversely, during the summer period there will be a slight droughtiness restriction. The moisture deficits in this low rainfall area are moderately large and the available water capacities of these soils are insufficient to provide the crops with their full moisture requirements and consequently in most years they will suffer slight drought stress.

Grade 3a

3.4 An area of Grade 3a has been mapped at the northern end of the site. This area correlates with the slightly lighter textured and better drained variants of Soil Type II described in paragraph 4.6 These soils have been assessed as Wetness Class II and due to the heavy clay loam or clay topsoil texture have a moderate wetness and workability limitation and are therefore restricted to Grade 3a.

Grade 3b

3.5 The majority of the site has been classified as Grade 3b. This area corresponds to the typical soils within the Soil Type II mapping unit described in paragraph 4.6. These soils have a clay topsoil over a slowly permeable clay upper subsoil and have been assessed as Wetness Class III. They consequently have a moderately severe wetness and workability restriction which limits the flexibility of the land from growing a range of agricultural crops. This land is therefore restricted to Grade 3b potential.

4.0 SOIL PHYSICAL CHARACTERISTICS

Geology

4.1 The published solid and drift edition 1:50,000 scale geology map sheet 158 (BGS 1984) shows the site to comprise predominantly first river terrace deposits. Approximately 25% of the southern portion of the site comprises alluvium.

Soils

4.2 The Soil Survey of England and Wales have mapped the area at a scale of 1:250,000 (Soil Surv, 1983) and the site is shown to comprise the Clayhithe Association (*1) with a small area of Fladbury 1 Association (*2) to the south.

4.3 During the current survey two distinct soil types were identified and their locations are shown on the accompanying map. Soil Type I which is mapped at the southern end of the site comprises fine loamy soils over sand and gravel. Despite the presence of ochreous mottling in the subsoil horizons the soils have been assessed as Wetness Class I due to the presence of coarse pores in the subsoil. The mottling is considered to relate to former drainage conditions.

4.4 The remainder of the site has been mapped as Soil Type II, which comprises clayey over fine loamy soils over sands and gravels. These soils have a non calcareous clay topsoil over a strongly mottled clay upper subsoil, which is slowly permeable. The lower subsoil is generally a fine sandy clay loam which in many profiles is calcareous and this overlies the sand and gravel. These soils have been assessed as Wetness Class III. At the northern end of the site a slightly better variant was found where the soils are generally slightly lighter textured, clay/heavy clay loam over fine sandy clay loam and are slightly better drained, Wetness Class II.

(*1) Clayhithe Association Deep humose fine loamy over sandy and fine loamy over clayey soils, mainly calcareous. Some peat soils. Groundwater controlled by ditches and pumps.

(*2) Fladbury 1 Association Stoneless clayey alluvial soils.

SOIL TYPE I (4.5 ha)

4.5 Stoneless dark grey brown medium/heavy clay loam over mottled yellowish brown heavy clay loam over fine sandy clay loam or medium sandy loam.

Topsoil	Texture	medium/heavy clay loam, occasionally sandy clay loam
	Colour	dark grey brown 10YR3/3
	Stone	stoneless
	$CaCO_3$	non calcareous
	Depth	35 cm
Subsoil 1	Texture	heavy clay loam
	Colour	yellowish brown 10YR5/4
	Mottles	common distinct ochreous and grey
	Stone	stoneless
	Structure	very coarse subangular blocky
	Depth	50-70 cm
Subsoil 2	Texture	fine sandy clay loam, sandy loam and occasional sandy lenses
	Colour	yellowish brown 10YR5/4
	Mottles	common distinct ochreous
	Stone	stoneless to moderately gravelly
	Structure	weak coarse subangular blocky

Wetness Class I

SOIL TYPE II (25 ha)

4.6 Dark grey brown clay over yellowish brown strongly mottled clay over mottled fine sandy clay loam.

Topsoil	Texture	clay, (occasionally heavy clay loam at northern end of site)
	Colour	dark grey brown 10YR4/3 and 3/3
	Stone	stoneless
	$CaCO_3$	non calcareous
	Depth	30-35 cm average 33 cm
Subsoil 1	Texture	clay (occasionally heavy clay loam at northern end of site)
	Colour	yellowish brown 10YR5/3 occasionally 10YR5/4
	Mottles	many distinct ochreous and grey
	Stone	stoneless
	Structure	medium and coarse prismatic
	$CaCO_3$	non calcareous
	Depth	55-65 cm (90 cm at south end)

Subsoil 2	Texture	fine sandy clay loam
	Colour	yellowish brown 10YR5/4
	Mottles	common distinct ochreous and grey
	Stone	stoneless
	Structure	very coarse subangular blocky
	$CaCO_3$	occasionally calcareous

Wetness Class III (Wetness Class II on the lighter textured variants at the northern end of the site)

Both soil types are underlain by sands and gravels. The depth to the underlying gravel ranges from 75 cm depth at the northern end of the site to >120 cm further south.

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REFERENCES

British Geological Survey. 1984. Solid and Drift edition Geology Map Sheet 158, 'Peterborough', 1:50,000 scale.

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