Cambs/13/93

PHYSICAL CHARACTERISTICS REPORT INCORPORATING AGRICULTURAL LAND CLASSIFICATION

LAND AT LORDSHIP FARM, HINXTON, CAMBRIDGESHIRE

1.0 INTRODUCTION

1.1 A Soil and Agricultural Land Classification (ALC) survey was carried out over 20.6 ha of land at Lordship Farm, Hinxton, Cambridgeshire in connection with a planning application to extract sand and gravel.

1.2 The site is located to the north of the village of Hinxton and is bounded to the north by a small wood beyond which is the A505 road. The southern boundary is also formed by a small woodland whilst to the east and west are agricultural fields.

1.3 At the time of survey the central portion of the site was already being worked for sand and gravel and being partly filled with imported inert fill material. The land to the north of this area has been subsoiled and partly ploughed, whilst the land to the south was in cereal stubble.

1.4 A total of 12 observations were made on the undisturbed land using a spade and dutch auger and all were stopped prematurely by impenetrable gravel. In addition a soil pit was dug to help characterise the subsoil in greater detail.

1.5 On the published Provisional 1:63,360 scale ALC map for the area, Sheet No. 148 (MAFF, 1968), the area is shown as grade 2.

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 581 mm making this one of the drier parts of the country. The period for which soils are likely to be at field capacity in this area is approximately 106 days.

2.2 The accumulated temperature for the site is approximately 1442 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 are 120 and 115 mm respectively.

2.3 Although there is no climatic limitation to the agricultural use of the site, the low rainfall and high moisture deficits may impose droughtiness restrictions due to the interaction between climate and soils.

Relief

2.4 The site is located on the flood plain of the River Granta and is therefore relatively flat although on the field at the northern end there is a very gentle slope to the east to a ditch running down the eastern boundary. The site lies at an altitude of approximately 27 m AOD.

2.5 There are therefore no limitations to the use of the site as a result of relief or altitude.

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). The undisturbed land has been mapped as grade 3a, whilst the mineral workings are shown as non-agricultural. A breakdown of the areas is given below:

Grade	Area (ha)	%
3a	12.9	63
Non-agricultural	7.7	37
TOTAL	20.6	100

Grade 3a

3.2 All the undisturbed land has been mapped as grade 3a due to a moderate droughtiness limitation. The soils, which are described in detail in paragraph 4.3, are coarse loamy over sand and gravel and consequently only have a moderate

available water capacity (AWC). Moisture balance calculations indicate that such soils will be regarded as moderately droughty in this low rainfall area and therefore restricted to grade 3a.

4.0 SOIL PHYSICAL CHARACTERISTICS

Geology

4.1 The site is mapped as Pleistocene Valley Gravels - Lowest and Intermediate Terraces, over Middle Chalk, on the 1:63,360 scale geological map of the area (Geol Surv. 1952).

Soils

4.2 The 1:250,000 scale soil map (Soil Surv, 1984) shows the whole area to comprise soils of the Swaffham Prior Association (*1) although the more detailed 1:63,360 scale map of the Saffron Walden District (Soil Surv, 1969) shows a small area of Milton Association (*2) between the railway line and the A130 road, with Swaffham Prior soils to the east.

4.3 One soil type was mapped on the undisturbed soils of the site which correlated well with soils of the Milton Association. A typical profile on the site has a dark greyish brown medium sandy loam topsoil which is generally slightly stony, ranging from 3-6% small and medium flints in the south and 6-12% at the northern end, beneath which is a dark brown slightly to moderately stony medium sandy loam or occasionally sandy clay loam upper subsoil. Below 45 to 60 cm the soil generally becomes a stony loamy medium sand before the calcareous sands and gravels are encountered below 70-80 cm depth. The soils are permeable and free draining and have been assessed as wetness class I.

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(*1) Swaffham Prior Association: Coarse loamy and fine loamy typical brown calcareous earths over chalk or rubbly chalky drift. Well drained.

(*2) Milton Association: Coarse loamy superficial deposits, 18 to 36 inches thick, over calcareous river terrace gravels. Free to imperfect drainage.

REFERENCES

GEOLOGICAL SURVEY OF GREAT BRITAIN (1952). Solid and Drift Edition Geology Map Sheet No. 205 (Saffron Walen) 1:50,000.

MAFF (1968). Agricultural Land Classification Map (provisional) Sheet No. 148 1:63,360 scale.

MAFF (1988). Agricultural Land Classification of England and Wales - Revised guidelines and criteria for grading the quality of agricultural land.

METEOROLOGICAL OFFICE (1989). Climatological data for Agricultural Land Classification.

SOIL SURVEY OF ENGLAND AND WALES (1969). Soils of the Saffron Walden District.

SOIL SURVEY OF ENGLAND AND WALES (1984). Soils and their Use in Eastern England.

APPENDIX 1

SOIL PHYSICAL CHARACTERISTICS

LORDSHIP FARM, HINXTON, CAMBRIDGESHIRE

SOIL TYPE 1 (12.1 ha)

Topsoil	Texture	:	medium sandy loam
	Colour	:	10YR4/3 dark greyish brown
	Stones	:	slightly stony, 3-12% small and medium subangular flints.
	$CaCO_3$	:	non calcareous
	Depth	:	30 cm
Subsoil 1	Texture	:	medium sandy loam occasionally sandy clay loam.
	Colour	:	7.5YR4/4 and 4/6 dark brown
	Mottles	:	none
	Structure	:	moderate medium subangular blocky
	Consistence	:	friable
	Stones	:	slightly to moderately stony 5-20% small medium and large subangular flints.
	$CaCO_3$	:	non calcareous
	Depth	:	45 to 65 cm (N.B. see note below referring to subsoil 2).
Subsoil 2*	Texture	:	loamy medium sandy occasionally sandy clay loam.
	Colour	:	10YR5/6 yellowish brown
	Mottles	:	none
	Stones	:	moderately stony 20-35% flints
	$CaCO_3$	:	non calcareous
	Depth	:	70-80 cm

Wetness class I

* N.B. This horizon is not always present, although where absent, subsoil 1 is found to occur to a similar depth.

The soil profile is underlain by calcareous sand and gravel with approximately 60% flints and very fine chalk fragments.