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AGRICULTURAL LAND CLASSIFICATION AND STATEMENT OF SOIL PHYSICAL CHARACTERISTICS

LAND AT SHRUBLAND PARK ESTATE

1.0 BACKGROUND

1.1 A detailed survey was carried out over 27.0 ha of land at Shrubland Park Estate, Coddenham, Suffolk. This land is the subject of a planning application to extract sand and gravel and thereafter to restore the land to its original levels above inert fill. The north-eastern area is to be used for the storage of soils and to provide screening of the site workings.

1.2 The site is located 1.5 km to the south-west of the village of Coddenham and forms a small part lying within the Shrubland Park Estate. A landing-strip some 35 m wide runs across the site from east to west, covering 2.1 ha.

1.3 A detailed survey was carried out to determine whether any best and most versatile land exists within the application area. On the published 1:63,360 scale Agricultural Land Classification (ALC) map (MAFF, 1972) the whole area is mapped as Grade 4. However, this map is of a reconnaissance nature and the current survey was undertaken to provide more detail for the site.

1.4 A total of 27 auger borings were made using a dutch auger to a depth of 1.2 m unless stopped by impenetrable stony layers. In addition 3 soil pits representative of the main soil types found were dug to assess subsoil conditions in more detail. The fieldwork was carried out during 2/3 August 1995.

1.5 At the time of the survey the land south of the landing-strip carried maize. Immediately north of the landing strip were crops of barley, in the west, and weedy,low maize in the

east. The north of the site was growing sugar beet and the small part of the site to the east of the access track supported barley.

1.6 Irrigation water is available to the site. However, this is insufficient to affect the overall ALC grading of the site.

2.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

2.1 Climatic criteria are considered when classifying land as these may have an overriding limitation in terms of the agricultural use of the land. The main parameters used in the assessment of the overall climatic limitation are average annual rainfall, as a measure of overall wetness, and accumulated temperature (day °C Jan-June) as a measure of the relative warmth of an area.

2.2 A detailed assessment of the prevailing climate for the site has been made by interpolation from the 5 km grid dataset produced by the Meteorological Office (Met. Office, 1989). The details are given in Table 1 and these show that there is no overall climatic limitation affecting the site.

2.3 Climatic factors do, however, interact with soil properties to influence soil wetness and droughtiness. The climate in this area is relatively dry and warm and consequently the likelihood of a droughtiness limitation may be enhanced depending on soil conditions.

Table 1: Climatic Interpolation

Grid reference	TM 121 537
Altitude (m)	52
Accumulated Temperature (Day °C, Jan-June)	1396
Average Annual Rainfall (mm)	596
Moisture Deficit, Wheat (mm)	119
Moisture Deficit, Potatoes (mm)	114
Field Capacity (Days)	109
Overall Climatic Grade	1

Altitude and Relief

2.4 The site forms part of an undulating plateau developed in Pleistocene deposits. For the most part the land occupies an almost flat (<2% gradients) upper slope and crestal position at 52-55 m AOD. However, in the north-east the land slopes down to 50 m AOD at 3% gradient. Altitude and relief do not impose any limitation on the agricultural quality of the site.

Geology and Soils

2.5 The published 1:50 000 geological map (Geol. Surv., 1990) shows the entire site to be underlain by Glacial Sand and Gravel and Kesgrave Sands and Gravel undifferentiated. Earlier mapping (Geol. Surv., 1950) indicates that the Pleistocene sands and gravels are underlain by chalk.

2.6 The reconnaissance soil survey map for the area (Soil Surv., 1983) shows most of the site to comprise soils from the Melford (*1) Association. There are smaller areas of Swaffham Prior (*2) Association around the northern and southern margins of the site.

(*1) Melford Association: Deep well-drained fine and coarse loamy over clayey soils and deep fine loamy soils, both overlying chalky till.

(*2) Swaffham Prior Association: Deep well-drained calcareous coarse and fine loamy soils over chalk rubble.

2.7 The detailed survey carried out on the site shows the presence of three distinct soil types over the site and these are described briefly in the following paragraphs.

Soil Type 1 (Refer to Soil Types Map and Appendix 1)

2.8 Soil Type 1 comprises deep well-drained fine loamy over clayey soils mapped in the west of the site. These soils have a dark brown or dark yellowish brown sandy clay loam (occasionally sandy loam) topsoil with a few small, medium and large hard stones and flints. The topsoil overlies a dark yellowish brown clay loam, sandy clay or clay horizon with a similar stone content to the topsoil. Dark yellowish brown clay containing few small and medium chalk fragments and a few hard stones is generally encountered within 65 cm depth. The soil structural condition is assessed as moderate throughout and the soil is assessed as wetness class I.

Soil Type 2 (Refer to Soil Types Map and Appendix 1)

2.9 This soil is differentiated from Type 1 by having a coarse loamy topsoil and upper subsoil with a good structural condition overlying the aforementioned chalky clay. Textures in the upper part of the soil profile are usually medium or coarse sandy loam extending to between 40 and 80 cm. Below this occurs the clay, or sometimes a transitional sandy clay loam or sandy clay horizon above the clay. The colour, stoniness and wetness class of Soil Type 2 are similar to Type 1.

Soil Type 3 (Refer to Soil Types Map and Appendix 1)

2.10 Soil Type 3 is mapped in the north-east of the site and approximately corresponds both to the more sloping land and the area which it is not proposed to excavate. As elsewhere the soils are deep and well-drained but they are characterised by the absence of fine loamy and clayey material within 1.2 m. The soils have a dark brown sandy loam topsoil with few to common small to large hard stones and flints. The soils become sandier with depth and yellowish brown loamy sand or sand is generally encountered between 50 and 80 cm. The subsoil is slightly stony. The structural condition of Soil Type 3 is assessed as good and the profile assessed as wetness class I.

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3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The land has been classified using the guidelines contained in the Agricultural Land Classification of England and Wales (MAFF, 1988). A breakdown of the individual grades found on the site is given in Table 2.

Table 2: Distribution of Grades and Subgrades

AGRICULTURAL LAND CLASSIFICATION

Grade	Area (ha)	%
2	19.8	73
3a	4.6	17
Non-Agricultural	2.1	8
Urban	0.5	2
TOTAL	27.0	100

Grade 2

3.2 The well-drained loamy soils overlying clay, namely Soil Types 1 and 2 (paragraphs 2.8 and 2.9), are restricted to Grade 2 because of the minor limitations of a slightly stony topsoil and droughtiness. Moisture balance calculations indicate that in this relatively dry area the soils' available water capacities are somewhat inadequate for crop requirements. The irrigation potentially available is insufficient to upgrade the land classification.

Subgrade 3a

3.2 The coarse loamy over sandy soils, Soil Type 3 (paragraph 2.10), are restricted to Subgrade 3a on account of a moderate droughtiness limitation. The moisture balance calculations show the soil available water capacity to be limiting for the requirements of certain crops. The degree of stoniness and the depth to the sandy subsoil vary importantly, such that some Grade 2 profiles occur locally. However, this variability linked to the scale of mapping makes it impractical to delineate these areas separately. Again, the amount of water that might be supplied by irrigation is insufficient to upgrade the land classification.

Non-Agricultural

3.3 The area of the runway across the site was mapped as non-agricultural.

Urban

3.4 The gravelled access tracks across the site were mapped as urban.

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REFERENCES

BRITISH GEOLOGICAL SURVEY, 1990. Sheet 207, Ipswich, Solid and Drift. Provisional. 1:50 000 scale.

GEOLOGICAL SURVEY OF GREAT BRITAIN, 1950. Sheet 207, Ipswich, 1:63 360 scale.

MAFF, 1972. Agricultural Land Classification Map. Provisional. Scale 1:63 360, Sheet 150.

MAFF, 1988. Agricultural Land Classification of England and Wales (Revised Guidelines and Criteria for grading the quality of agricultural land). Alnwick.

METEOROLOGICAL OFFICE, 1989. Climatological Data for Agricultural Land Classification.

SOIL SURVEY OF ENGLAND AND WALES, 1983. Sheet 4, "Soils of Eastern England". 1:250 000 scale.

Appendix 1

DESCRIPTION OF SOIL PHYSICAL CHARACTERISTICS

SOIL TYPE 1

Topsoil	Texture	:	sandy clay loam (occasionally sandy loam)
	Colour	:	dark brown 10YR3/3 or dark yellowish brown 10YR3/4
	Stones	:	slightly stony, 5-7% small to large
	Depth	:	27 cm
	Boundary	:	clear wavy
Upper Subsoil	Texture	:	clay or medium clay loam
	Colour	:	dark yellowish brown 10YR4/4 or yellowish brown 10YR5/5
	Stones	:	slightly stony, 5-7% small to large
	Structure	:	weak coarse subangular blocky
	Roots	:	few very fine and fine, many between some peds
	Depth	:	55 / 85 cm
	Boundary	:	clear wavy
Lower Subsoil	Texture	:	clay
	Colour	:	dark yellowish brown 10YR4/6 or yellowish brown 10YR5/6
	Stones	:	very slightly and slightly stony, 3-10% small to large including few soft chalk fragments
	Structure	:	weak coarse subangular blocky
	Roots	:	few very fine and fine
	Depth	:	120+ cm

Wetness Class I

SOIL TYPE 2

Topsoil	Texture	:	medium sandy loam
	Colour	:	dark brown 10YR3/3 or dark yellowish brown 10YR3/4
	Stones	:	slightly stony, 5-10% small to large
	Depth	:	20/35 cm
	Boundary	:	clear smooth
Upper Subsoil	Texture	:	medium sandy loam (occasionally sandy clay loam)
	Colour	:	dark yellowish brown 10YR4/4 or yellowish brown 10YR5/4-5/6
	Stones	:	slightly stony, 5-10% small to large
	Structure	:	weak coarse subangular blocky
	Roots	:	common fine and medium, few coarse

	Depth	:	45/85 cm
	Boundary	:	clear wavy
Lower Subsoil	Texture	:	clay
	Colour	:	dark yellowish brown 10YR4.5/6 and yellowish brown 10YR5/6
	Stones	:	very slightly and slightly stony, 2-10% small to large including few chalk fragments
	Structure	:	weak very coarse subangular blocky
	Roots	:	few very fine
	Depth	:	120+ cm

Wetness Class I

<u>SOIL TYPE 3</u>

Topsoil	Texture	:	medium sandy loam
	Colour	:	dark brown 10YR3/3
	Stones	:	slightly and very slightly stony, 5-7% small to large
	Depth	:	26 cm
	Boundary	:	clear smooth
Upper Subsoil	Texture	:	medium sandy loam
	Colour	:	dark brown 10YR3/3 and dark yellowish brown 10YR4/4
	Stones	:	slightly and very slightly stony, 3-10% small to large
	Structure	:	weak very coarse angular and subangular blocky
	Roots	:	common fine and medium
	Depth	:	50 cm
	Boundary	:	clear smooth
Lower Subsoil	Texture	:	loamy medium sand to sand
	Colour	:	yellowish brown 10YR4.5/6
	Stones	:	very slightly stony, 2% small; locally slightly stony, 10% small
	Structure	:	weak fine and medium subangular blocky to single grain
	Roots	:	common medium, few coarse and fine
	Depth	:	120+ cm

Wetness Class I