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AGRICULTURAL LAND CLASSIFICATION AND SOIL PHYSICAL CHARACTERISTICS

EARSHAM, BUNGAY, NORFOLK

1. INTRODUCTION

1.1 The site, an area of 10.4 hectares, is the subject of an application to extract sand and gravel. MAFF carried out a detailed soil survey of the site in February 1992. 12 soil inspections using a Dutch soil auger were made on a 100 metre grid basis. Two soil inspection pits were also dug to assess subsoil conditions and supplement soil auger boring information.

1.2 On the published Provisional Agricultural Land Classification (ALC) Map, sheet 137 (1:63,360 scale, MAFF 1973), the site area is shown entirely as grade 3. The current survey was undertaken to provide more detailed information on the land quality of the site.

2. AGRICULTURAL LAND CLASSIFICATION

2.1 Following a detailed survey the site is entirely mapped as subgrade 3b and is limited by droughtiness imperfections. Two main soil types were identified and they are more fully described in paragraphs 4.3 and 4.4.

2.2 The definition of Agricultural Land Classification subgrade 3b is included in Appendix 1.

3. SITE PHYSICAL CHARACTERISTICS

Altitude and Relief

3.1 The site area is gently undulating ranging from 12 metres AOD in the north and south to 7 metres AOD towards the centre where a small dip develops to the east outside the site boundary. Gradient and altitude do not constitute limitations to the ALC grade.

Climate

3.2 Climate data for the site was obtained from the published agricultural

climatic dataset produced by the Meteorological Office (Met Office, 1989). This indicates a site average annual rainfall of 615 mm (24.2 inches). Field capacity days are 118. This also indicates that the accumulated temperature for this area is approximately 1424 day degrees Celsius. Soil moisture deficits for wheat and potatoes are 121 mm and 117 mm respectively. These climatic characteristics do not impose any climatic limitation on the ALC grading of the survey site.

Surface Stoniness

3.3 Estimates of total stoniness and surface stones in excess of 2 cm were made at each auger point across the site. At key locations riddling was undertaken to confirm stone quantities critical to individual ALC grades.

3.4 The percentage of topsoil stones larger than 2 cm varied over the site area from 2 to 21%, but were typically between 5 and 15% often restricting land quality to grade 2 and subgrade 3a. Occasionally patches in excess of 15% were identified on the shallow slopes bordering the central hollow and these areas were restricted to subgrade 3b on topsoil stoniness grounds.

4. SOIL PHYSICAL CHARACTERISTICS

Geology

4.1 At a reconnaissance scale of 1:253,440 the published drift edition Geology Map Sheet 16 (Geological Survey, 1931), shows the site to be entirely mapped as recent and post glacial valley gravel (partly glacial).

Soils

4.2 No detailed soils map exists for the area. However the 1:250,000 reconnaissance scale soils map "Soils of Eastern England" (Soil Survey and England and Wales, 1983) shows the occurrence of Newport 3 Soil Association over the whole site area. During the current survey a more detailed inspection of the soils broadly confirmed these findings identifying 2 soil types.

Soil Type 1 (see Appendix 2 and Soil Types Map)

4.3 This soil type occurs on the southern half of the site and typically comprises very slightly to moderately stony medium sandy loam, occasionally loamy medium sand and sandy clay loam topsoils. Upper subsoils are variable in texture, but typically comprise very slightly to moderately stony loamy medium sand, occasionally sandy clay loam and medium sand. Lower subsoils consist of very slightly stony, occasionally very stony loamy medium sand and to a lesser extent medium sand. Profiles are permeable (wetness class I) and typically non calcareous throughout.

Soil Type 2 (see Appendix 2 and Soil Types Map)

4.4 This soil type occurs on the northern half of the site with its boundary with Soil Type 1 roughly associated with the shallow trough (described in paragraph 3.1). Topsoils are typically moderately stony sandy clay loams. The subsoil consists of very stony loamy medium sand. As with Soil Type 1 profiles are permeable (wetness class I) and typically non calcareous throughout.

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APPENDIX 1

DESCRIPTION OF ALC SUBGRADE 3b

Subgrade 3b - moderate quality agricultural land. Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.

APPENDIX 2

SOIL PHYSICAL CHARACTERISTICS

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SOIL TYPE 1 (5.0 hectares)

Topsoil	Texture	:	typically medium sandy loam, occasionally loamy medium sand, sandy clay loam.
	$CaCO_3$	:	non calcareous
	Colour	:	dark greyish brown (10YR 4/2)
	Total stone	:	variable, in the range 5-19%. Typically 15-19% mainly small and medium rounded, subrounded and subangular flints, few large.
	Structure	:	cultivation zone - not applicable
	Boundary	:	clear smooth
	Roots	:	common fine and very fine
	Depth	:	35/40 cm, typically 38/40 cm
Upper Subsoil	Texture	:	typically loamy medium sand, occasionally sandy clay loam, medium sand.
	$CaCO_3$	:	non calcareous
	Colour	:	yellowish brown (10YR 5/6) and dark brown brown (10YR 4/3).
	Total stone	:	variable, in the range 2-20%. Typically 2-5% and 15-20% mainly small and medium rounded, subrounded and subangular flints, few large.
	Structure	:	weakly developed coarse subangular blocky when not too stony to assess.
	Boundary	:	abrupt smooth
	Roots	:	common fine and very fine
	Depth	:	50/70 cm, typically 50/55 cm

Lower Subsoil	Texture	:	loamy medium sandy,occasionally medium sand
	$CaCO_3$	:	non calcareous
	Colour	:	yellowish brown (10YR 5/6) dark yellowish brown (10YR 4/6).
	Total stone	:	variable, 1-40%. Typically 1-5% mainly small and medium rounded, subrounded and subangular flints.
	Structure	:	weakly developed coarse angular blocky when not too stony to assess.
	Boundary	:	base of pit
	Roots	:	few fine and very fine
	Depth	:	120 cm

SOIL TYPE 2 (5.4 hectares)

Topsoil	Texture	:	sandy clay loam
	$CaCO_3$	:	non calcareous
	Colour	:	dark greyish brown (10YR 4/2)
	Total stone	:	variable, in the range 12-34%. typically 30-34% small and medium rounded, subrounded and subangular flints few large.
	Structure	:	cultivation zone - not applicable
	Boundary	:	abrupt smooth
	Roots	:	common fine and very fine
	Depth	:	38/40 cm
Subsoil	Texture	:	loamy medium sand
	$CaCO_3$	:	*non calcareous*
	Colour	:	dark brown/brown (10YR 4/3) and yellowish brown (10YR 5/6).
	Total stone	:	typically very stony 55-65% mainly small, medium gravel. Few large flints and occasional boulder.
	Structure	:	too stony to assess
	Boundary	:	bottom of pit
	Roots	:	common fine and very fine becoming few fine and very fine from 60 cm.
	Depth	:	120 cm

REFERENCES

GEOLOGICAL SURVEY OF ENGLAND WALES, 1931. Drift edition Geology Sheet 16. 1:253,440 scale.

MAFF, 1973. Agricultural Land Classification Map No 137. Provisional 1:63,360 scale.

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