Cambs 05/91

AGRICULTURAL LAND CLASSIFICATION AND SOIL PHYSICAL CHARACTERISTICS

BRIDGE PIT NORTH, WICKEN, CAMBRIDGESHIRE

1. INTRODUCTION

1.1 The site, an area of 8.7 hectares is the subject of an application to quarry limestone. MAFF carried out a detailed soil survey of the site area in March 1991. A total of 15 soil inspections were made using a Dutch soil auger and were supplemented by 2 soil inspection pits to assess subsoil conditions.

1.2 On the published Agricultural Land Classification (ALC) Map, Sheet 135 (Provisional 1:63,360 scale MAFF, 1971), the survey area is shown entirely as grade 2. The current survey was undertaken to provide more detailed information on the land quality of the site.

2. AGRICULTURAL LAND CLASSIFICATION

2.1 The site is entirely mapped as subgrade 3a. The definition of the Agricultural Land Classification (ALC) subgrade 3a is included in Appendix 1.

Subgrade 3a

2.2 The site has been graded 3a and is associated with one soil type (described in paragraph 4.3). The soils which are developed directly from underlying Jurassic limestone are relatively uniform in nature, comprising fine loamy topsoils over clayey subsoils which contain increasing quantities of weathered limestone and overlie unweathered limestone at depth. These soils are freely draining (wetness class I/II) and are limited by droughtiness imperfections arising from the inability of plant roots to penetrate deeply into the underlying unweathered limestone rock to supplement plant available water resources.

3. SITE PHYSICAL CHARACTERISTICS AFFECTING LAND QUALITY

Altitude and Relief

3.1 The site occupies a level, low lying position at 5 to 6 metres AOD. Neither gradient nor altitude constitute limitations to the quality of agricultural land.

Climate

3.2 Climate data for the site was obtained by interpolating data from the published agricultural climatic dataset produced by the Meteorological Office (Met Office, 1989). This indicates an average annual rainfall of 550 mm (21.7 inches). Field capacity days are 94. This also indicates the accumulated temperature for this area to be approximately 1454 day degrees Celsius. Soil moisture deficits for wheat and potatoes are 122 mm and 119 mm respectively. The climatic characteristics do not impose any climatic limitation on the ALC grading of the survey site.

4. SOIL PHYSICAL CHARACTERISTICS

Geology

4.1 The published 1:50,000 scale Solid and Drift edition Geology Map No 188 (Cambridge) (Geological Survey of Great Britain, 1981) shows the site to comprise of Jurassic West Walton Beds including Upware Limestone.

Soils

4.2 The published 1:63,360 scale Soils Map No 188 (Cambridge) (Soil Survey of England and Wales, 1963) shows the site area to comprise brown calcareous fine textured soils of the Upware series, whose parent material is a brashy Jurassic limestone of which Upware limestone is part. The current detailed inspection of the soils broadly confirmed the presence of one soil type described overleaf.

Soil Type 1 (refer to Appendix 2).

4.3 This soil type covers the entire site and typically comprises heavy clay loam topsoils over variably (negligible to moderately) stony upper subsoils of clay and less typically heavy clay loam. Lower subsoils comprise a mixture of clay and weathered limestone fragments. The limestone fragments increase in volume with depth and give way to solid unweathered limestone at approximately 75-80 cm. The stonier upper subsoils varients are scattered over the site and do not have any pattern to their location, thus these were not delineated separately.

March 1992

Resource Planning Group
Cambridge RO

APPENDIX 1

DESCRIPTION OF AGRICULTURAL LAND CLASSIFICATION SUBGRADE 3a

Subgrade 3a - good quality agricultural land

Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.

APPENDIX 2

SOIL PHYSICAL CHARACTERISTICS

BRIDGE PIT NORTH, WICKEN, CAMBRIDGESHIRE

Soil Type 1 (8.7 ha)

Topsoil	Texture	:	heavy clay loam
	$CaCO_3$	:	calcareous
	Colour	:	brown (10YR 4.5/3)
	Stone	:	very slightly stony 1/5% small flints and limestone.
	Structure	:	cultivation zone - not applicable
	Boundary	:	clear wavy and clear smooth
	Roots	:	common fine and very fine and many fine and very fine.
	Depth	:	in the range 27/35 cm typically 30 cm
Upper subsoil	Texture	:	clay occasionally heavy clay loam
	$CaCO_3$	:	calcareous
	Colour	:	light olive brown (2.5YR 5/6) olive yellow (2/5YR 6/6 and 2.5YR 6/8) and yellowish brown (10YR 5/4).
	Stone	:	variable, mainly negligible with occasionally 10/30% limestone fragments.
	Structure	:	moderately developed coarse angular and sub angular blocky.
	Boundary	:	clear wavy and discontinuous broken/irregular.
	Roots	:	common fine and very fine
	Depth	:	in the range 40/75 cm typically 50/60 cm

Lower subsoil*	Texture	:	30/80% weathered limestone and clay
	$CaCO_3$	:	calcareous
	Colour	:	white (10YR 8/2)
	Stone	:	variable, 30/80% limestone fragments and rubble increasing with depth.
	Structure	:	weakly developed medium and coarse platey.
	Boundary	:	clear wavy
	Roots	:	common fine and very fine especially in subsoil.
	Depth	:	in the range 40/85 cm, typically 75/85 cm (40 cm as one boring exhibited weathered limestone beneath topsoil).

* Parent Material:- Jurassic Upware limestone. This hard unweathered limestone is encountered typically from 75 to 80 cm depth.

REFERENCES

GEOLOGICAL SURVEY OF GREAT BRITAIN (ENGLAND AND WALES), 1981, Solid and drift edition Geology Map No. 188 (Cambridge) 1:50,000 scale.

MAFF, 1971, Agricultural Land Classification Map Sheet 135 Provisional. 1:63,360 scale

MAFF, 1988. Agricultural Land Classification of England and Wales (Revised Guidelines and Criteria for Grading the Quality of Agricultural Land), Alnwick.

METEOROLOGICAL OFFICE, 1989. Published climatic data extracted from the agroclimatic dataset compiled by the Meteorological Office (Met Office 1989).

SOIL SURVEY OF ENGLAND AND WALES, 1963. Soil Map Sheet 188 (Cambridge) 1:63,360 scale.