104/93 Cambs 104/93

AGRICULTURAL LAND CLASSIFICATION

CAMBRIDGE ROWING LAKE EXTENSION, MILTON, CAMBRIDGESHIRE

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CAMBRIDGE ROWING LAKE (EXTENSION) WATERBEACH, CAMBRIDGE

1.0 BACKGROUND

1.1 This 39.5 hectare site was surveyed in January 1994 by ADAS Statutory Group for MAFF in order to assess land quality in connection with an extension to the proposed rowing lake. A previous survey on land to the east and south was carried out in connection with the original application in July 1992, and a single map showing the findings from both surveys has now been produced.. This report, however, refers only to the extension area.

1.2 A total of 32 auger borings were made at a density of 1 per hectare, and this information was supplemented by data collected from two soil profile pits.

1.3 Land towards the southern part of the extension site, which forms part of Penfold Farm, was not surveyed as unconditional access was denied.

1.4 On the published Agricultural Land Classification Map Sheet 135 (MAFF, 1971) the site is shown as predominantly grade 2 with a smaller area of grade 3 in the northeast running parallel to the Roman Canal. Since this map is of a reconnaissance nature, designed primarily for strategic planning purposes, the current, survey was undertaken to provide more detailed information on land quality.

2.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

2.1 Site specific climatic information has been obtained by interpolating data contained within the 5 km grid dataset produced by the Meteorological Office (Met Office 1989). This information shows that the site has an average annual rainfall of 566 mm and accumulated temperature of 1459°C. Moisture deficits are relatively high, being 121 mm for wheat and 117 mm for potatoes, and the site is at field capacity for 94 days each year. These figures impose no climatic limitation to the site, although the low rainfall experienced over the site in combination with light textured soils, can impose a moderate droughtiness limitation.

Altitude and Relief

2.2 The site lies on flat land to the west of the River Cam at a height of approximately 5 m AOD. Gradient is not a limitation to agricultural use.

Geology and Soils

2.3 The published 1:50,000 scale geology map sheet 188 (GSGB 1981) shows the site to comprise predominantly second terrace deposits with a small area of first terrace deposits in the south and an area of Gault in the north and northeast.

2.4 On the published 1:63,360 scale soils map sheet 135 (SSEW 1976) the site is shown as Milton Association (*1) with Midelney Association (*2) running adjacent to the southeast boundary.

2.5 Two soils type were found on site, reflecting the variability of the mapped Milton soils.

2.6 Firstly, soils which occur over the first and second terrace gravels have been mapped over the majority of the site. Profiles comprise medium clay loam or sandy clay loam topsoils over similar or heavy clay loam upper subsoils. These overlie loamy sand or sand with up to 40% flint gravel from depths of 55/80 cms, occasionally deeper. Locally, bands of clay are encountered within the profile. Topsoils are very slightly stony and the soils are occasionally calcareous throughout. Wetness class has been assessed as I and II due to local groundwater problems. At the time of the field survey, localised very wet areas were encountered where groundwater normally within the gravels was found to be at a very shallow depth, probably due to the very wet weather conditions in the month prior to survey.

(*1) Milton Association: Deep permeable calcareous fine loamy soils variably affected by groundwater. Some similar shallower well drained soils over gravel in places. Complex soils patterns locally.

(*2) Midelney Association: Stoneless clayey soils mostly overlying peat. Soils variably affected by groundwater which is, in place, controlled by ditches and pumps. Flat land, risk of flooding locally.

2.7 Secondly, soils which are developed on the Gault have been mapped in the north and northeast of the site. Profiles comprise medium clay loam or sandy clay loam topsoils over heavy clay loam or sandy clay loam upper subsoils and over slowly permeable sandy clay or clay at depth. The soils are very slightly stony and locally calcareous throughout. Wetness class is assessed as II, occasionally I.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The site has been graded using the Revised Guidelines and Criteria for the grading of Agricultural Land (MAFF, 1988). The major limitation on this site is droughtiness, although winter wetness and workability were associated with some of the land to the south and east (1992 survey). The methodology contained in the 1988 publication for droughtiness assessment measures the average drought risk experienced by two reference crops, deep rooting winter wheat and shallower rooting maincrop potatoes. These crops were selected because they are widely grown and in terms of susceptibility to drought are representative of a broad range of crops.

3.2 The site has been graded predominantly subgrade 3a with a smaller area of grade 2 in the north and northeast. A very small area of subgrade 3b has been mapped in the northeast of the site, and part of the site was unsurveyed.

A full breakdown of the ALC grades, in hectares and percentage terms, is given below, covering a revised hectarage for the original site, the hectarage of the extension area and also that for the total site.

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Grade	Revised original area ha	Extension area ha	Total area ha	% of total
2	1.0	11.0	12.0	11
3a	23.6	19.2	42.8	39
3b	40.7	0.3	41.0	37
Non Ag.	0.3	-	0.3	1
Unsurveyed	4.4	9.0	13.4	12
TOTAL	70.0	39.5	109.5	100

3.2 Definitions of the ALC grades are given in Appendix 1.

Grade 2

3.3 Grade 2 land occurs in the north and northeast of the site, corresponding to the moderately well drained soils described in paragraph 2.7 derived from the Gault deposits. This land is restricted from a higher grade by minor winter wetness and workability limitations, and by minor summer droughtiness limitations.

Subgrade 3a

3.4 Subgrade 3a land covers most of the site and corresponds to the moderately well drained, terrace derived soils described in paragraph 2.6. These soils generally have medium textured upper horizons giving moderately good available water capacities for shallower rooting crops. However, the sandy and gravelly lower horizons will result in a more limited available water capacity for deeper rooting crops, and as such, the land has been restricted to subgrade 3a.

Subgrade 3b

3.5 A very small area of subgrade 3b land has been mapped in the northeast of the site and corresponds to an imperfectly drained, heavier variant of the soils described in paragraph 2.7. This area is therefore restricted from a higher grade by a moderate wetness limitation.

Unsurveyed

3.6 Due to difficulties in obtaining unconditional access, part of the site was not surveyed.

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REFERENCES

GEOLOGICAL SURVEY OF GREAT BRITAIN. Sheet 188, Cambridge. Solid and drift edition, 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 the grading the quality of Agricultural Land), Alnwick.

METEOROLOGICAL OFFICE, 1989. Data extracted from the published agroclimatic dataset.

SOIL SURVEY OF ENGLAND AND WALES, 1976. Sheet 135, Cambridge and Ely, 1:63,360 scale.

SOIL SURVEY OF ENGLAND AND WALES, 1984. Soils and their use in Eastern England, C A Hodges *et al*, Harpenden.

Appendix 1

Grade 1 - excellent quality agricultural land

Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly include top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality.

Grade 2 - very good quality agricultural land

Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable crops. The level of yield is generally high but may be lower or more variable than Grade 1.

Grade 3 - good to moderate quality agricultural land

Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

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.

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.

Grade 4 - poor quality agricultural land

Land with severe limitations which significantly restrict the range of crops and/or levels of yields. It is mainly suited to grass with occasional arable crops (eg. cereals and forage crops) the yield of which are variable. In most climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

Grade 5 - very poor quality agricultural land

Land with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.