Cambs 70/89

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AGRICULTURAL LAND CLASSIFICATION

SLATE HALL FARM, BAR HILL, CAMBRIDGESHIRE

1. BACKGROUND

1.1 The site, an area of 146.3 hectares, is the subject of an application for the development of a shopping centre complex near Bar Hill, Cambridgeshire. MAFF surveyed the site in January and February 1990 to assess the agricultural land quality.

1.2 On the published Agricultural Land Classification map sheet No 135 (provisional, scale 1:63360 (MAFF, 1971)), the area is shown as mainly grade 2 with smaller areas of grade 3 in the vicinity of New Close Farm and the south east corner of the site.

2. PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

2.1 Climate data for the site was obtained from the published agricultural climatic dataset. (Met Office, 1989). This indicates that for the site's median altitude of 15m AOD the annual average rainfall is 547mm (21.5"). This data also indicates that field capacity days are 89 and moisture deficits are 118mm for wheat and 113mm for potatoes. These climatic characteristics do not impose any climatic limitations on the ALC grading of the survey site.

Altitude and Relief

2.2 The land surveyed is gently undulating and ranges in altitude from 13m to 20m AOD. The altitude is at a maximum around the track at Grid Ref: TL388640 and falls gently towards the northwest and east/south east to 14m and 13m AOD respectively. Gradient and altitude do not constitute limitations to the ALC grade.

Geology and Soils

2.3 The published 1:50,000 scale drift edition geology map sheet 187 (Geological Survey of GB 1975) shows the survey area to comprise Lower Greensand deposits through the central part and smaller deposits of Kimmerdge Clay and Gault Clay to the northwest and southeast corners of the site respectively.

2.4 The Soil Survey of England and Wales have mapped the soils in the area on two occasions; firstly, in 1973 at a scale of 1:63360 and secondly, in 1983, at a reconnaissance scale of 1:250,000. These maps show the occurrence of the Wicken (*1), Denchworth (*2) and Evesham 3 (*3) Associations where the clayey geological deposits outcrop and the Cottenham (*4) and Bearsted 1 (*5) Associations where the Lower Greensand deposits occur. During the current survey a more detailed inspection of the soils was carried out.

Three main soil types occur over the site.

(*1) Wicken Association 1973 : Gleyed brown calcareous soil (Grey calcareous Jurassic or Cretaceous Clay with thin Head).

(*2) Denchworth Association 1973 : Gleyed brown calcareous soil (Grey calcareous and non calcareous Jurassic and Cretaceous Clays).

(*3) Evesham 3 Association 1983 : Slowly permeable calcareous clayey and fine loamy over clayey soils. Some slowly permeable seasonally waterlogged non-calcareous clayey soils. (Jurassic and Cretaceous Clay).

(*4) Cottenham Association 1973 : Brown Earth (may be gleyed) (Lower Greensand with drift).

(*5) Bearsted 1 Association 1983 : Well drained coarse loamy and sandy soils over sand or sandstone, in places ferruginous. Some slowly permeable coarse and fine loamy soils affected by ground water. (Cretaceous sand and sandstone).

2.4.1 In the vicinity of the depot, GR:TL 391642 and Slate Hall Farm slightly droughty deep fine loamy soils predominate. They typically comprise sandy clay loam or occasionally sandy loam topsoils over (sandy) clay, (sandy) heavy clay loam or occasionally sandy clay loam subsoils to depth. (50/120cm^{+}) At depth the profiles may overlie the following:-

2.4.1a) East of Slate Hall Farm below depths of 70/80cm^{+} profiles often contain approximately 10-20% small and very small ironstone nodules which either extend to 120cm or occur in thin bands of varying thicknesses.

2.4.1b) In the vicinity of Slate Hall Farm and north of the depot subsoils typically merge into loamy medium sand at depths 85/100cm^{+}.

2.4.1c) North of the track running between New Close Farm and Slate Hall Farm subsoils generally merge into gleyed calcareous clays 50/115cm^{+}.

2.4.2 North east of the depot and in the northwest and southeast quarters of the site clayey soils predominate. These soils typically comprise heavy clay loam or clay (in the south east) topsoils over clay or occasionally heavy clay loam subsoils which often become calcareous at depth (50/60cm^{+}). Towards the south east profiles are often calcareous in the upper horizons and topsoil clay content typically exceeds 50%.

2.4.3 Gravelly soils outcrop in a small area in the vicinity of New Close Farm. The soils typically comprise medium clay loam or occasionally heavy clay loam topsoils over slightly stony gleyed heavy clay loam subsoils which generally merge into gravelly material* at depths 50/90cm^{+}. Subsoils often become moderately stony in thin bands directly above the gravelly material. North of New Close Farm Cottages profiles typically overlie gleyed clay, below the gravel, at depths 90/120cm^{+}.

* Gravelly material: typically comprises 50% flints in a matrix of medium sand and clay loam pockets.

3. AGRICULTURAL LAND CLASSIFICATION

3.1 The definition of the Agricultural Land Classification grades are included in Appendix 1.

3.2 The table below shows the breakdown of ALC grades in hectares and % terms for the survey area.

AGRICULTURAL LAND CLASSIFICATION

Grade	ha	%
2	41.0	28
3a	76.3	52.2
3b	25.7	17.6
Urban	0.4	0.3
Agricultural Buildings	2.9	1.9
TOTAL	146.3	100

3.3 GRADE 2

Approximately a quarter of the survey area has been mapped as grade 2. This land is associated with the soils described in paragraph 2.4.1 and subparagraphs 2.4.1a), 2.4.1b) and 2.4.1c).

3.3.1 Where the soil variants described in subparagraphs 2.4.1a) and 2.4.1b) occur the profiles are freely draining (wetness class 1) and hold moderately good reserves of water. The ironstone fragments or coarse textures at depth together with the fine loamy profile textures impose a slight limitation on the water holding capacity of these soil profiles. As a result, the minor droughtiness limitation restricts this land to grade 2.

3.3.2 Where the soil variants described in sub paragraph 2.4.1c) occur the fine loamy upper horizons overlie slowly permeable clays at depths (50/115cm^{+} ie wetness class I or II). These profiles are slightly droughty because the fine loamy textures impose a slight limitation on

the available profile moisture reserves. Within this area topsoils are typically sandy clay loams. As a result slight droughtiness, and where profiles are wetness class II, slight wetness and workability, imperfections exclude this land from a higher grade.

3.4 SUBGRADE 3a

The majority of the survey area has been mapped as subgrade 3a.

3.4.1 Most of the land graded 3a occurs in association with the better drained variants of the soils described in paragraph 2.4.2 above. Soil profile pit observations indicated that the subsoils are slowly permeable at depth, typically 45/55cm^{+} (ie wetness class II). This land is consequently limited by moderate wetness and workability imperfections which derive from the reduced subsoil permeability at depth combined with the heavy, decalcified**, topsoil textures. These factors restrict the land to subgrade 3a (Good quality agricultural land).

3.4.2 The remainder of the land graded 3a occurs in association with the moderately droughty gravelly soil variants described in paragraph 2.4.3. (Profiles are typically slowly permeable at depth (ie wetness class II) and topsoils are fine loamy (eg medium clay loams).) The presence of flints, in varying densities, moderately reduces the waterholding capacity of these profiles. As a result the moderate droughtiness imperfection constitutes the chief limitation to the ALC grade.

3.5 SUBGRADE 3b

The remainder of the survey area (approximately 18%) has been mapped as subgrade 3b. These areas occur towards the northwest and southeast corners of the site.

3.5.1 Towards the southeast corner of the site and north of New Close Farm the land is associated with the soils described in paragraph 2.4.2. Topsoils comprise decalcified** heavy clays (45/50 %$^{+}$ Clay)

** Decalcified - Towards the southeast profiles can be calcareous throughout, however topsoil clay contents exceed 50%.

which overlie subsoils of similar textures. Subsoils are slowly permeable directly below the topsoil and as a result the drainage status has been assessed as wetness class III. Thus the wetness and workability imperfections impose a significant limitation on the agricultural potential of this land. Hence the land is restricted to subgrade 3b (Moderate quality agricultural land).

3.5.2 North of New Close Farm Cottages the land graded 3b is associated with the heavier gravelly soils described in paragraph 2.4.3. Topsoils typically comprise non calcareous heavy clay loams over gleyed subsoils which overlie gravelly material at depth. Profile pit observations indicate that the subsoils are slowly permeable directly below the topsoil (ie wetness class III). As a result significant wetness and workability limitations exclude this land from a higher grade.

3.6 URBAN

The depot on the A604 road has been mapped as urban.

May 1990

Resource Planning Group
Cambridge RO

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 includes 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 root crops. The level of yield is generally high but may be lower more more variable than Grade 1.

Grade 3 - good to moderate quality agricultural land

Land with moderate limitations will affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. When more demanding crops and 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 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 level of yields. It is mainly suited to grass with occasional arable crops (eg cereals and forage crops) the yields 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.

References

GEOLOGICAL SURVEY OF GREAT BRITIAN 1975 Drift edition Geology Sheet No 187, 1:50,000 scale.

MAFF 1971, Agricultural Land Classification Map Sheet 135, scale 1:63360.

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

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

SOIL SURVEY OF ENGLAND AND WALES 1973 (Provisional) The Soils of Cambridge and Ely scale 1:63360.

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