

AGRICULTURAL LAND CLASSIFICATION

IRETON'S WAY, NR CHATTERIS, CAMBRIDGESHIRE

SEMI-DETAILED SURVEY

1. BACKGROUND

1.1 The site an area of 176.4 hectares, is the subject of an application for the development of a golf course complex interspersed with housing near Chatteris. MAFF surveyed the site in July 1991 to assess the agricultural land quality.

1.2 The survey was carried out at an auger boring density of one per two hectares. These inspections were supplemented by observations from 7 soil profile pits.

1.3 At the time of survey the site was mainly in arable cultivation, typical crops included sugar beet, potatoes, carrots, cereals and grass.

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 0m AOD the annual average rainfall is 547mm (21.5"). This data also indicates that field capacity days are 88 and moisture deficits are 119mm for wheat and 115mm 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 lies fairly level ranging in altitude from 0m to 1m AOD. Gradient and altitude do not constitute limitations to the ALC grade.

Geology and Soils

- 2.3 The published 1:50,000 scale geology map No (Geol.Surv,1980) shows the survey area to comprise Nordelph peat to the south and river terrace gravels to the north.
- 2.4 The Soil Survey of England and Wales have mapped the soils in the area at a reconnaissance scale of 1:250,000 in 1983. This map shows the occurrence of the Ireton Association (*1) over the whole of the site. During the current survey a more detailed inspection of the soils was carried out.

Three main soil types occur over the site.

- 2.4.1 Adjacent to the Crooked Drain (the southern perimeter of the site) peat soils derived from the Nordelph peat outcrop. Profiles typically comprise peaty loam topsoils over organic loams or peat loams of variable depth over porous marine clay. Field pH readings below 30 cm depth ranged from 4.5 to 6. Acidic horizons (ie pH less than 5) are formed by the oxidation of pyrite (Ferrous disulphide) which is a stable constituent of some anaerobic marine sediments (MAFF, 1983). When drained, air is allowed to penetrate the soil mass and the pyrite oxidises to form sulphuric acid, which impairs the development of plant roots through the soil profile. Where these marine sediments occur close to the surface, namely in the south east corner of the site, the soils are acidic at a shallow depth. This acidity is not easily rectified below 40 cm by normal liming operations and therefore constitutes a limitation to land quality since plant roots are unable to extract water stored in the soil at depth. In most cases rooting is not impeded at all or only at depths greater than 60 cm because the acidic marine sediments only occur at depth.

(*1)Ireton Association: Permeable humose coarse and fine loamy soils associated with humose calcareous coarse loamy over sandy soils. Groundwater controlled by ditches and pumps.

2.4.2 Lying north of the peaty soils and adjacent to the Crooked Drain at the southern most tip of the site outcrop organic soils which are derived where the Nordelph peat has largely wasted from the area of terrace gravels. Successive cultivations have progressively incorporated the peat remnant into the underlying mineral soil, resulting in topsoils having organic textures. Laboratory analyses on a range of typical topsoil textures indicate organic matter levels are in the range of 8 to 13%. Enhanced levels of organic matter effectively contribute to the water storage capacity of the soil and help offset any susceptibility to drought stress. Profiles typically comprise organic clay or organic loam topsoils over non organic very slightly or slightly stony fine or coarse loams* which variable overlies gravel deposits** at depths 65/80cm+. Above the gravel deposits soils may become moderately stony below depths of 50/55 cm. Profile pH ranges from 6 to 7.

2.4.3 The remainder of the site (approximately 55%) comprises non organic terrace gravel soils. Profiles typically comprise medium clay loam or medium sandy silt loam topsoils over very slightly to slightly stony fine or coarse loams* which overlies gravel deposits** 50/60cm+ or lighter soils with negligible stone (textures namely loamy medium sand, medium sand or loamy coarse sand). The latter is most common adjacent and west of Ireton's Way (A142 road), variably these profiles overlies gravel deposits** at depths of 80/85cm+. In some instances where gravel occurs below 70/80 cm depth moderately stony horizons are common. Interspersed within this soil type are shallower and deeper profiles over the gravel, however they are too sporadic to delineate separately.

* namely heavy clay loams, sandy clay loams, medium clay loams or sandy silt loams.

**gravel deposits; typically 50% flints in a loamy medium sand or medium sand matrix, often calcareous.

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	%
1	24.4	13.8
2	40.0	22.7
3a	110.4	62.6
Non Agricultural/ Agricultural Buildings	1.6	0.9
TOTAL	176.4	100

3.3 Irrigation

Of the whole site one small area to the south west is known to be irrigated. Irrigation is likely to enhance the potential of the terrace soils, to some degree, in this area. However it is considered that there is an insufficient quantity of water available to effect the grading of the land. Consequently the land has been graded on an assessment of its potential without irrigation.

3.4 GRADE 1

Land adjacent to the Crooked Drain and east of Swards Farm has been graded 1. This land is associated with the peaty soils described in paragraph 2.4.1. Soil profile pit observations indicate that the subsoils are porous due to the presence of a dense network of coarse interlinking vertical reed channels. Thus the soil drainage status has been assessed as wetness Class I. Profile pH is

typically 5 or greater except in the vicinity of Grid Reference TL410824 where pH are 4.5 at depth. Soil pit observations in both areas indicate that rooting is only inhibited in the vicinity of grid Reference TL410824; and there only at depth where the marine clay is encountered. Due to the high organic matter content of these soils they contain high reserves of available water for crop growth. Consequently profiles are only very slightly droughty and capable of producing consistently high yields of a wide range of crops.

3.5 Grade 2

Land graded 2 is associated with the organic terrace gravel derived soils described in paragraph 2.4.2. Profiles are freely draining (wetness Class I) and hold moderately good reserves of water. The profile flints together with the fine loamy 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.

3.6 Subgrade 3a

Approximately 60% of the site has been graded 3a. Two main situations occur.

- 3.6.1 The majority of the land graded 3a is associated with the soils described in paragraph 2.4.3. These soils have a reduced capacity for soil water storage because of a combination of factors; namely lower levels of topsoil organic matter, higher profile stone volumes, a reduced depth of soil over gravel and a greater proportion of less water retentive loamy sand and sand textures in the upper profile (adjacent to Ireton's Way). Consequently the land is limited by moderate droughtiness imperfections. Although individual profiles of better and poorer grades were noted within this grade 3a land, they occur too sporadically to warrant separate delineation at the scale shown.

3.6.2 Adjacent to the Crooked Drain at the south eastern edge of the site a small area of peaty soils (as described in paragraph 2.4.1) have been mapped as 3a. The marine sediment is extremely acidic and lies close to the surface. Due to this acidity the crop roots are unable to exploit these horizons for water. The land is consequently limited by droughtiness imperfections which are only partly offset by the high organic matter content of the topsoil.

3.7 Non Agricultural

A pond and small reservoir have been mapped as Non-Agricultural.

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