

AGRICULTURAL LAND CLASSIFICATION

SOUTHEAST OF M11/A505 JUNCTION, DUXFORD, CAMBRIDGESHIRE

1.0 INTRODUCTION

- 1.1 Land on this 70 hectare site was inspected during July 1989 in connection with proposals to develop a sub-regional shopping centre and leisure development. A total of 79 soil inspections were made on site on a 100 metre grid basis and supplementary information was collected from four soil profile pits. At the time of survey the land was in arable use, typical crops including cereals, sugar beet and peas.

2.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

Relief

- 2.1 The site occupies a wide, gently sloping open valley feature. Altitude ranges from just over 34 metres close to the M11 roundabout in the west, to a little over 25 metres where the valley bottom crosses the north eastern site boundary. Neither altitude nor relief constitute limiting factors to agricultural land quality.

Climate

- 2.2 Site specific climatic data was obtained from the 5 km grid agroclimatic dataset produced by the Meteorological Office (Met Office, 1989). This shows average annual rainfall to be approximately 582 mm (23.3 inches) which is low by national standards. Soils are likely to be at field capacity for a relatively short period of approximately 105 days.
- 2.3 The accumulated temperature for this area is approximately 1431 degrees celsius. This parameter indicates the cumulative build up of warmth available for crop growth and has an influence on the development of

soil moisture deficits (SMD)*. Soil moisture deficits of 119 mm and 115 mm are recorded for wheat and potatoes respectively. In order to counter the effects of these deficits (in terms of drought stress in crops) it is necessary for soils to hold adequate reserves of plant available water.

Geology

- 2.4 The geology of this area is shown on the 1:63,360 scale geology map, sheet number 205. This shows the site is comprised of Middle Chalk, which is overlain in a small area flanking the Moorfield Road in the east by the river valley gravels, and, in a narrow strip bordering the A505 (Royston Road) by glacial gravels. Elsewhere the Chalk is shown as being exposed.

Soils

- 2.5 No detailed soils map exists for this area. However the 1:250,000 scale soils map indicates the site is mainly comprised of soils of the Swaffham Prior soil association, with smaller areas of Milton and Moulton soil associations occurring along the southeast and northern boundaries respectively. Detailed field survey observations broadly confirm this description but indicate that the two minor soil associations are rather smaller in extent than indicated on the published 1:250,000 scale map.
- 2.6 In very general terms soils occurring on site are free draining (wetness class I) and comprise medium loamy (sandy clay loam, medium clay loam, sandy loam and sandy silt loam) textures overlying poorly structured rubbly chalky drift**, which in turn overlies hard chalk at depth.

* SMD represents the balance between rainfall and potential evapotranspiration occurring during the growing season. For ALC purposes the soil moisture deficits developing under a winter wheat and maincrop potato cover are considered. These 'reference' crops have been selected because they are widely grown and in terms of their susceptibility to drought, are representative of a wide range of crops.

** Rubbly chalky drift: chalk stones in a matrix of finely divided chalk mixed with sand, having a dense laminar/platy structure.

Occasionally, on the valley sides, sandy clay loam textures directly overlie chalk at variable depths. Soil pit observations on site indicate that in most locations the chalk and rubbly chalky drift substrates are fairly hard, have relatively few fissures and shows only limited penetration by plant roots. (In many instances a dense root mat was observed at the surface of the underlying chalk, indicative of a root penetration problem.) In general terms soils were only very slightly stony at the surface (comprising mainly medium and small rounded chalk pebbles and subangular flints) - often becoming slightly or occasionally moderately stony at depth.

2.7 Evidence of some slight soil disturbance was noted in the vicinity of the reservoir. This is believed to be associated with the removal of runway lights previously required for the Duxford airfield and does not constitute a limitation to land use.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 This site is covered by a current irrigation license, which at present is unused. If utilised this modest irrigation facility would make feasible the production of a small area of more demanding crops (eg potatoes) or very slightly enhanced yields of crops currently produced without the benefit of irrigation (eg. sugar beet and peas). However (it should be noted that) the abstraction levels permitted under this license are inadequate to permit any overall upgrading of land quality. Therefore the breakdown of ALC grades presented below, and on the accompanying map refers to the long term agricultural potential of the site in an unirrigated state.

3.2 ALC	Hectares	%
3a	34.3	48.7
3b	<u>36.1</u>	<u>51.3</u>
Total	<u>70.4</u>	<u>100.0</u>

Grade 3a

3.3 This is mapped extensively on gently sloping land on the mid valley sides. Profiles are typically stoneless or very slightly stony and comprise of moderately deep profiles of sandy clay loam and clay loam

textures typically overlying chalk or poorly structured rubbly chalky drift below 60 cm. The land is limited by droughtiness imperfections which derive from the inability of crop roots to deeply penetrate the underlying chalk, or rubbly chalky drift, and fully exploit the reserves of plant available water it holds.

Grade 3b

- 3.4 This occurs extensively on site where shallower, variably stony medium loamy soils overlie rubbly chalky drift between 35-60 cm, which subsequently overlies chalk at depth. This land is limited by slightly more severe droughtiness constraints arising from the reduced depth of medium loamy soil material over poorly structured rubbly chalky drift or chalk.

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