Cambs 31/93

AGRICULTURAL LAND CLASSIFICATION SURVEY
LAND AT KINGSWAY GOLF CENTRE, MELBOURN, CAMBRIDGESHIRE

1.0 INTRODUCTION

1.1 An Agricultural Land Classification (ALC) survey was carried out over 41.1 ha of land adjacent to the Kingsway Golf Centre, Melbourn, Cambridgeshire in connection with a planning application for an extension to the Golf Centre.

1.2 The Golf Centre is located approximately 1 km to the north east of the village of Melbourn. The application site lies to the south of the existing golf course development and is bounded on the eastern side by the old A10 road into Melbourn and to the south by a farm track across which is open farm land.

1.3 A total of 41 auger borings were made using a dutch auger to a depth of 1.2 m unless prevented by impenetrable chalk. In addition 3 soil pits were dug to determine the extent of rooting into the underlying chalk.

1.4 At the time of survey the entire site was growing a crop of winter wheat.

1.5 The site is mapped as Grade 2 on the published 1:63,360 scale provisional ALC map for the area (MAFF, 1968).

2.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

2.1 Climatic information for the site has been interpolated from the 5 km grid dataset produced by the Meteorological Office (Met Office 1989). The average annual rainfall for the site is 584 mm and the number of days that the soils are likely to be at field capacity is 104.

2.2 The accumulated temperature for the area is approximately 1447 degrees Celsius. This parameter indicates the cumulative build up of warmth available for crop growth and in conjunction with rainfall has an influence on the development of soil moisture deficits and susceptibility to drought. The moisture deficits for wheat and potatoes on this site are 119 mm and 115 mm respectively.

2.3 There is no overall climatic limitation to the agricultural use of the land although due to the low rainfall and high accumulated temperature, moisture deficits in the area are high. This will mean that unless the soils can provide large amounts of available water, then the crops will be subjected to drought stress.

Relief

2.4 The site is gently undulating ranging in altitude from 22 m AOD at the western end, rising to approximately 25 m AOD in the middle of the site and falling again toward the east. Relief therefore is not limiting to the agricultural potential of the site.

Geology and Soils

2.5 The 1:50,000 scale drift geology map for the area (Geol Surv, 1976) shows the area to be underlain by Lower Chalk and the current survey confirms this with soft chalk encountered in many profiles.

2.6 A reconnaissance survey of the area carried out by the Soil Survey of England and Wales (Soil Surv, 1969) shows the site predominantly to comprise soils of the Swaffham Prior Association* with small areas at the east and west of the site to be occupied by soils of the Burwell Association+.

2.7 The current survey revealed relatively uniform soils over the whole site with the main difference being the depth to the underlying soft weathered chalk which was generally deeper around the edges of the site on the slightly lower land.

2.8 A typical soil profile has a greyish brown strongly calcareous medium clay loam topsoil which is generally well structured and very porous. The topsoil is approximately 30-35 cm deep with few small flint stones. The subsoil, a yellowish brown medium or heavy clay loam, has a moderately well developed coarse subangular blocky structure which is moderately porous. The subsoil is strongly calcareous and where the chalk is encountered at shallow depths the soil contains large amounts of weathered chalk.

2.9 Beneath the subsoil the soft greyish weathered chalk is encountered. The upper part of the chalk has common soil filled cracks and fissures as well as vertical worm channels which contain many fine roots which decrease with depth. The depth to the underlying chalk varied across the site from immediately below the topsoil to greater than 1 m. Three soil pits were dug where the chalk was encountered within 60 cm depth and in each instance rooting was observed to at least 100 cm depth. In a few profiles, yellowish sandy pockets were found in the chalks, giving rise to a sandy clay loam subsoil.

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*Swaffham Prior Association: Free draining calcareous soils developed in chalky and loamy drift over solid chalk occupying much of the rolling country along the chalk scarp in south Cambridgeshire.

+Burwell Association: Highly calcareous loamy soils developed in a pale grey chalk marl with evidence of gleying.

2.10 The soils are all considered to be free draining despite the presence of some ochreous staining in the weathered chalk. This staining is considered to be the result of oxidation of segregated ferrous compounds in the original sedimentary deposit rather than contemporary gleying (Soil Surv 1969).

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The site has been classified using the guidelines contained in the Agricultural Land Classification of England and Wales (MAFF, 1988). A breakdown of the grades found is given below:

Grade	Area (ha)	%
2	19.1	46
3a	22.0	54
TOTAL	41.1	100

Grade 2

3.2 The major limitation associated with this site is droughtiness, caused by a reduction in the plant available water capacity from the soil as a result of a restriction of rooting depth in the underlying chalk strata. Moisture balance calculations reveal that where the chalk is found below 60 cm and roots extend into the weathered chalk to below 1 m depth, sufficient plant available water exists for both wheat and potatoes, to qualify for a Grade 2 potential. Consequently where the deeper soils have been mapped, or very soft highly weathered chalk extends to below 1 m depth then the land has been classified as grade 2.

Grade 3a

3.3 The shallower soils on the site have been classified as Grade 3a due to the increased droughtiness limitation. This area largely corresponds to the slightly higher land on the site. Within this area the underlying chalk is generally encountered between 30 and 60 cm depth resulting in the area being moderately droughty for both wheat and potatoes, restricting it to Grade 3a.

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REFERENCES

Geological Survey, (1976). Drift Edition Geological Map, Sheet 204, Biggleswade, 1:50,000 scale.

MAFF, (1968). Provisional Agricultural Land Classification Map, Sheet 148, 1:63,360 scale.

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

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