

AGRICULTURAL LAND CLASSIFICATION SURVEY
LAND AT BOURNES GREEN, SOUTHEND, ESSEX.

1.0 INTRODUCTION

- 1.1 An Agricultural Land Classification (ALC) survey was carried out over 78.3 ha of land at Bournes Green, Southend, Essex in connection with a planning application for a golf course development.
- 1.2 The site is located to the east of Southend and is bounded on its southern boundary by the A13 road and to the north by the B1017. The western boundary abuts a school and associated development alongside the B1017 road whilst to the east of the site is open agricultural land.
- 1.3 The whole site is in arable agricultural use and at the time of survey the majority of the land was in winter cereals, with a small area on the western side, cultivated but not yet sown.
- 1.4 A total of 77 auger borings were made using a dutch auger to a depth of 1.1 m unless prevented by impenetrable stones. In addition four soil pits were dug to help assess subsoil conditions.
- 1.5 The site is shown as Grade 1 on the published 1:63,360 scale provisional ALC map for the area (MAFF, 1969).

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 539 mm and the number of days that the soils are likely to be at field capacity is 90.
- 2.2 The accumulated temperature for the area is approximately 1478 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 130 mm and 129 mm respectively.
- 2.3 There is no overall climatic limitation to the agricultural use of the land although due to the very low rainfall and high accumulated temperature, moisture deficits in the area are very 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 north and eastern part of the site is relatively level, but the land to the west of the track falls gently toward the south west corner of the site. Slopes do not exceed 3° anywhere on the site. The altitude ranges from approximately 12 m AOD in the north and east to approximately 8 m AOD in the south west corner. Relief therefore does not impose any limitation on the agricultural quality of the site.

Geology and Soils

- 2.5 The published 1:50,000 scale geology map (Geol Surv. 1976) shows the majority of the area to comprise 1st Terrace River Deposits of Loam (River Brickearth), with a small area of Head Brickearth in the north west corner of the site. Along the western edge of the site, the area is mapped as Head. The whole site has been mapped by the Soil Survey of England and Wales (Soil Surv. 1984) as Hamble 2 Association*.
- 2.6 Three distinct soil types have been mapped during the current survey and their location is shown on the accompanying plan. Over the eastern part of the site and also in the north west corner, soils developed in the Brickearth have been mapped (Soil Type 1). These soils have a greyish brown medium silty clay loam topsoil ranging in depth from 30 to 35 cm (average 33 cm) with very few small flints, overlying a yellowish brown heavy silty clay loam subsoil. Below about 80 cm the soil becomes paler in colour and calcareous, with small concretions of calcium carbonate. The upper subsoil usually contains some manganiferrous nodules and in some profiles faint ochreous mottles although the soils are classified as Wetness Class I. The subsoils are generally stoneless throughout.
- 2.7 Over the western half of the site, heavy textured clayey soils (Soil Type 2) have been mapped. These soils generally have a grey brown heavy silty clay loam or very occasionally silty clay topsoil ranging in depth from 30 to 35 cm (Average 32 cm) with few small rounded flints, over a light brown clay subsoil. The subsoil is generally strongly mottled and slowly permeable, having a coarse angular blocky structure and no stones. The majority of the area has been classified as Wetness Class III although some profiles are better drained with mottling not evident above 50 cm depth in which case the soils are assessed as Wetness Class II. A small area of slightly stony soils has been identified where both the topsoil and upper subsoil contained up to 10% small and medium rounded flint pebbles over the stoneless clay.

* Hamble 2 Association: Deep stoneless silty soils, developed in thick, mainly aeolian silty drift (Brickearth), overlying river terrace sands and gravels.

2.8 In the centre of the site where the land begins to fall to the south west, a small area of shallow brickearth soils over river terrace gravels has been mapped. These soils have a slightly stony medium silty clay loam or clay loam topsoil 30 to 35 cm deep (average 33 cm) over a heavy silty clay loam or clay loam subsoil. The river terrace sands and gravels were generally encountered between 45 to 65 cm depth and were waterlogged.

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	%
2	40.3	51.5
3a	16.0	20.4
3b	22.0	28.1
<hr/>		
Total	78.3	100
<hr/>		

Grade 2

3.2 Two areas of Grade 2 have been mapped which correspond to the soils developed in the Brickearth (Soil Type I). The main limitation associated with these soils restricting them to a Grade 2 potential, is droughtiness. They have a moderately high available water capacity but in this very low rainfall area, where moisture deficits are high, shallower rooting crops such as potatoes will be susceptible to drought although deeper rooting crops such as wheat will generally have adequate moisture reserves. The free draining nature of these soils and the medium silty clay loam topsoil texture, mean these versatile soils are easily cultivated and can grow a wide range of crops only being restricted by a slight droughtiness limitation.

Grade 3a

3.3 Two areas of Grade 3a have been identified where the better drained clayey soils (Soil Type 2) have been mapped. The main limitations associated with these soils are both wetness and droughtiness. The soils have a heavy silty clay loam topsoil and have been assessed as Wetness Class II and consequently during the wetter periods of the year there will be a restriction on the time when they can be worked without causing structural damage to the soil. In addition, during the summer months the soils will have a droughtiness limitation. Moisture balance calculations indicate that these soils are moderately droughty in this low rainfall area restricting them to a Grade 3a potential.

Grade 3b

- 3.4 The poorer drained heavy textured clayey soils at the south and west of the site (Soil Type 2) together with the shallow soils over the River Terrace gravels (Soil Type 3) have been mapped as Grade 3b.^W The heavy textured clayey soils have a moderately severe wetness and workability restriction. These soils are assessed as Wetness Class III and with the heavy silty clay loam or silty clay topsoil texture will be very wet and intractable during the wetter periods of the year. This will curtail the opportunities when these soils can be safely worked without causing damage from compaction or smearing. Also, as with the better drained clayey soils described above, there will be a similar droughtiness limitation.
- 3.5 Soil Type 3 has been restricted to this grade as a result of a moderately severe droughtiness restriction. The available water capacity of these soils is relatively low due to the stone content of the soils and the shallow depth to the underlying gravels. Calculation of the moisture balance reveals that the crops will suffer moderately severe drought stress in this low rainfall area in most years.

January 1993

Resource Planning Team
ADAS, Cambridge.

REFERENCES

Geological Survey, (1976). Solid and Drift edition Geology Map, Sheet 258/259, Southend and Foulness, 1:50,000 scale.

MAFF, (1969). Provisional Agricultural Land Classification Map, Sheet 162, 1:63,360 scale.

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

Meteorological Office, (1989). Climatological Data for Agricultural Land Classification.

Soil Survey of England and Wales, (1984). Soils and their Use in Eastern England.