Cambs 26/93

AGRICULTURAL LAND CLASSIFICATION SURVEY
LAND AT MISTLEY, MANNINGTREE, ESSEX

1.0 INTRODUCTION

1.1 An Agricultural Land Classification (ALC) survey was carried out over 80.1 ha of land at Mistley, Manningtree, Essex in connection with a planning application for a golf course development.

1.2 The site is located to the south of Mistley and Manningtree and is bounded on its northern side by the main railway line to Harwich. To the south, the B1035 road forms the southern boundary whilst the remaining boundaries abut woodland or open agricultural land.

1.3 The southern and western parts of the site are in arable agriculture, which has some irrigation facilities, whilst the remainder of the site is in very old pasture, used for grazing, together with some extensive areas of woodland.

1.4 A total of 57 auger borings were made using a dutch auger to a depth of 1.2 m unless prevented by impenetrable stones. In addition a soil pit was dug to help assess subsoil conditions in greater detail.

1.5 The site is mapped as Grades 3 and 4 together with areas of non agricultural land on the 1:63,360 scale provisional ALC map for the area (MAFF 1972).

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 557 mm and the number of days that the soils are likely to be at field capacity is 98.

2.2 The accumulated temperature for the area is approximately 1443 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 129 mm and 126 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 site is located on the Essex coastal platform, an area which has been dissected by local streams giving rise to moderately strong localised relief. This site comprises parts of the coastal platform at the south and west of the site, with a valley bifurcated at its southern end, running almost due north. The valley sides are moderately steep to the south but become more gentle at the northern end of the site. Slopes along the valley sides range from 9^{o} in the south to $2-3^{o}$ in the north. Slopes at the southern end of the site are therefore limiting in terms of ALC grading.

2.5 The altitude of the site ranges from approximately 30 m AOD in the south to approximately 20 m AOD on the lower lying land to the north.

Geology and Soils

2.6 No detailed geology map of the area exists, but the 1:253,440 scale drift geology map for the area (Geol Surv, 1907) shows it to be underlain by London Clay on the lower lying land at the centre and north of the site with Glacial Sands and Gravels on the higher land of the coastal platform. This generalised geology correlates well with the soils found during the current survey.

2.7 The whole site has been mapped by the Soil Survey of England and Wales on the 1:250,000 scale soils map (SSEW, 1984) as Wix Association*.

2.8 Four distinct soil types have been identified on the site, during the current survey, which correlated well with the topography. The higher land of the southern and western parts of the site comprised coarse loamy and sandy soils developed in the glaciofluvial deposits. These soils typically have a medium sandy loam topsoil, approximately 30 cm deep, which at the south west and south east of the site are moderately stony (10-20% flints) although on the western side of the site are less stony (5-15%). The subsoil is generally a loamy sand becoming sand at depth, although slightly heavier variants were found on the western side of the site. Subsoil stone contents are variable ranging from approximately 5-35% flints. The soils are free draining.

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* Wix Association: The association is of varied composition and contains many soils. Most are developed in glaciofluvial drift over Eocene clay giving rise to coarse loamy or sandy soils variably affected by groundwater. On the lower lying land, slowly permeable, seasonally waterlogged fine loamy over clayey soils occur locally. Soil pattern is well defined by the landform.

2.9 On the gently to moderately steeply sloping land on the valley sides, loamy over clayey soils are found, although in some cases the underlying clay was not encountered within 1.2 m depth. Typically these soils have a medium sandy loam or occasionally sandy clay loam topsoil, approximately 30-35 cm deep, which is slightly stony (3-5% flints), over a sandy loam or sandy clay loam upper subsoil over a heavy clay loam or clay lower subsoil. In some profiles layers of loamy sand or sand were encountered above the clay. Many profiles have mottled subsoil horizons as a result of the slowly permeable clay strata and spring lines were evident on some of the slopes.

2.10 On the gently sloping land at the northern end of the site fine loamy over clayey soils were mapped. These soils have a medium clay loam or occasionally heavy clay loam topsoil (25-30 cm) over a mottled heavy clay loam upper subsoil. Below approximately 45-60 cm depth a pinkish grey strongly mottled clay is encountered. These soils, due to the slowly permeable subsoils, are waterlogged during the wetter parts of the year and have been classified as Wetness Class III.

2.11 On the low lying land of the valley floor, very wet alluvial soils occur which are generally fine loamy with coarse loamy or sandy layers in the subsoil. These soils have a slightly humose medium clay loam topsoil with common distinct ochreous mottling over a very wet strongly gleyed clay loam or sandy clay loam subsoil. In many profiles, very wet loamy sand layers were found at depth. The ground surface over much of the area is strongly poached with some areas under standing water. Due to the low lying nature of this land and the lack of freeboard for land drainage, these soils will remain waterlogged for much of the year and have been assessed as Wetness Class IV or V.

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)	%
3a	30.0	37.4
3b	18.8	23.5
4	14.1	17.6
Non agricultural	17.2	21.5
TOTAL	80.1	100

Grade 3a

3.2 Two areas of Grade 3a have been mapped with the largest area to the north and west of the site and a smaller area to the west of Beech Plantation. The field to the west of Dairy House Farm comprises the lighter textured stony soils described in paragraph 2.8, which are moderately droughty. Although the topsoil stone content in this field is often in excess of 15%, much of this is in the 1-2 cm size range and is therefore not limiting by itself but will contribute to lower the available water capacity of these soils. The available water is enhanced by the irrigation water, consequently the land has been graded 3a.

3.3 The field to the west of Beech Plantation which is also in arable cropping has also been graded as 3a. This area comprises the heavier textured soils described in paragraph 2.9 which are moderately droughty restricting them to a Grade 3a potential. This land also has irrigation facilities but it is not considered of benefit because of the localised areas of steeper slopes which may cause management difficulties especially in the even application of irrigation water.

3.4 The remainder of the land in this grade has no irrigation facilities. The field at the northern end of the site adjacent to the railway line, has been included in this grade due to a wetness and workability limitation. These soils described in paragraph 2.10 have been classified as Wetness Class III due to the underlying slowly permeable London Clay, and with medium clay loam topsoils are restricted to this grade as a result of a moderate wetness/workability limitation.

3.5 The remaining land to the south of the track on the gently sloping western side of the valley , comprising soils described in paragraph 2.9, has been restricted to grade 3a as a result of a moderate droughtiness limitation. These light to medium textured soils in this low rainfall area have insufficient available water to prevent crops from suffering from drought stress in the dry periods of the year.

Grade 3b

3.6 The moderately steeply sloping land on the site, which occurs in the south east corner and on the valley sides at the south western part of the site, has been restricted to this grade. Slopes in these areas range from 7 to 9° and as such are limiting. Where the Grade 3b land has been mapped on the more gently sloping valley sides to the north, then wetness is the major limitation. In these areas and to some extent on the more steeply sloping land to the south, spring lines are evident giving rise to very wet areas locally, restricting the capability of the land.

3.7 The arable field at the south west corner of the site comprises the stony sandy soils described in paragraph 2.8. These soils are very droughty and moisture balance calculations in this field indicate that they are Grade 4 potential. However irrigation facilities are available in this field with sufficient capacity for the whole of the command area fed from the reservoir and therefore this land has been upgraded to Grade 3b.

Grade 4

3.8 Two areas of Grade 4 have been identified. On the low lying land in the valley bottom, very wet alluvial soils have been mapped (see paragraph 2.11) which have been classified as Wetness Class IV or V. At the time of survey these soils were very wet with areas of standing water giving rise to severe poaching from the cattle. The low lying nature of this area and lack of freeboard mean that improvement by drainage would be extremely difficult and costly. It is understood that the area remains wet throughout the year and consequently the land is restricted to Grade 4.

3.9 On the higher land to the east of Beech Plantation very droughty stony and sandy soils were mapped (see paragraph 2.8). These soils have a very low available water capacity and a high stone content. Although irrigation facilities are available in this field, there is insufficient water available to satisfy the whole command area and as such there is not justification to warrant any upgrading. The small field to the north of Beech Plantation has also been included within this grade. This field appears to lack topsoil and with the very steep slopes on the western side (approximately 13^{o}) is under a heath grassland vegetation and has therefore been restricted to Grade 4.

Non Agricultural

3.10 Three areas of non agricultural land have been mapped on the site. These comprise predominantly woodland although the old buildings at Dairy Farm have been included as these are no longer used for any agricultural purpose connected with this land.

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REFERENCES

Geological Survey, (1907). Drift Edition Geological Map, Sheet 16 1:253,440 scale.

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