AGRICULTURAL LAND CLASSIFICATION

FORDWICK, CANTERBURY

1. BACKGROUND

1.1 In February 1991, a detailed Agricultural Land Classification (ALC) survey was carried out over 73 hectares of land at the eastern edge of Canterbury, in Kent, north and south of the River Great Stour at Fordwich. The work formed part of MAFF's statutory input to the preparation of the Kent Minerals Local Plan, which involved additional surveys at Wrotham Heath, Darenth, Charing and Hoo St Werburgh.

1.2 Land use?

2. PHYSICAL FACTORS AFFECTING LAND QUALITY

2.1 Relief

The site varies from 35 m A.O.D., to the north of the Great Stour, falling towards the river where the land is 5 m high, rising gently to 15 m south of the Great Stour. Slopes are gentle - moderate and nowhere does gradient form a limitation to land quality.

2.2 Climate

Climatic variables were obtained by interpolation from a 5 km grid database (Met. Office 1989). There are as follows:

Table 2: Climatic Interpolations

Grid Reference	61701602	61751596
Altitude (m)	20	15
Average Annual Rainfall (mm)	618	641
Accumulated Temperature (°days)	1472	1479
Field Capacity (days)	129	133
Moisture Deficit, Wheat (mm)	124	123
Moisture Deficit, Potatoes (mm)	120	119
Climatic Grade	1	1

The variables used in the assessment of an overall climatic limitation of site are the average rainfall and the accumulated temperatures. The average annual rainfall is a measure of the overall wetness of the site, and the accumulated temperature is a measure of the relative warmth of the locality. At Fordwich the combination of an accumulated temperature of 1472°-1479° and an average annual rainfall of 618-641, does not constitute a climatic limiting factor. No evidence of exposure was found at the site.

2.3 Geology

British Geological Survey sheets 273 and 289 (Faversham and Canterbury), show the site to be underlain by several drifts. On the lower lying central area of the site, alluvium is found. Bordering this alluvium both north and south is found the deep silty Head Brickearth. In the extreme south of the site is found River Terrace gravels, and on the higher ground to the north of the site Blue-Grey clay is found along with patches of coarse sand.

2.4 Soils

The Soil Survey of England and Wales, Sheet 6 (Soils of South-east England), shows that four soil associations are found on this site, generally occurring in sequence with underlying geology. Generally associated with the alluvium is found the clayey stoneless groundwater gleyed Fladbury 3 association, with the Head Brickearth

if found the deep, silty, variably drained Hamble 1 association. Clay gleyed surface water gleys Wickham 4 Association is found in the Blue-Grey clay, and coarse textured, well drained stony Sonning association is found in the River Terrace Gravels.

Detailed soil examination, revealed there to be six soil types on the site.

2.5 Type 1: In the extreme north of the site associated with the clay, are poorly drained clayey soils, comprising heavy clay loam/clay topsoils which are gleyed, over slowly permeable clay subsoil. Soils are placed in wetness class III.

2.6 Type 2: Associated with the head brickearth, north of the railroad, are found deep well drained fine loamy soils, comprising a medium clay loam topsoil, over medium clay loam/heavy clay loam and clay subsoils. Soils may be slightly prone to water erosion. All soil are in wetness class I.

2.7 Type 3: This type is dominant south of the railroad, in the northern part of the site. Soils consist medium clay loam/medium silty clay loam topsoils, over slowly permeable heavy clay loam/heavy silty clay loam subsoils, which become medium silty clay loams below 80 cm. Many soils have a very high water table and are prone to flooding. Soils are placed in wetness class III.

2.8 Type 4: A similar soil type to the one above, this soil is found on low lying land south of the Great Stour. Soils consist of a gleyed medium clay loam/medium silty clay loam/heavy clay loam/clay topsoil over a heavy clay loam/clay upper subsoil, over a gleyed silty clay/clay lower subsoil at 40 cm. Most soils are placed in wetness class III or occasionally II.

2.9 Type 5: This type s found on slightly higher ground south of the River Stour, associated with the Head Brickearth and comprises a medium clay loam topsoil over gleyed medium clay loam/medium silty clay loam subsoils. Soils are placed in wetness classes I and II.

2.10 Type 6: This soil type is found in the southern area of the site, and comprises a deep medium clay loam/medium silty clay loam/medium clay loam soil over gravel at a depth between 35 and 25 cm. All soils belong to wetness class I.

3. AGRICULTURAL LAND CLASSIFICATION

3.1 A detailed ALC survey was carried out in order to assess the degree to which the physical characteristics of the land impose long term limitation on its use for agriculture. The agricultural land classification was determined using the revised guidelines and criteria for grading the quality of agricultural land. A description of the ALC grades and subgrades is given as Appendix 1. The soil was examined to a depth of 1.2 metres by hand auger on an approximate 100 metre grid spacing. Seven soil pits were dug and described.

The extent and relative proportions of the ALC grades and subgrades are as follows.

Table 1: Distribution of the Grades and Sub-grades*

Grade	Area (ha)	% of Survey Area	% of Agricultural Land
2	22.6	30.7	38.3
3a	18.5	25.2	31.4
	41.1 ha	55.9	69.7
3b	17.9	24.3	30.3
Non-Agric	6.5	8.8	100% (59 ha)
Woodland	8.0	10.9	
	73.5 ha	100%	

3.2 Appendix 1 gives the general description of the grades and subgrades identified in this survey.

Northern Areas (North of Mill Road)

3.3 Grade 2: This area of grade 2 has free draining slightly stony soils, described in section 2.6 as Type 2 soils. There is no evidence of wetness in the profile and the soils are assigned to wetness class I. The medium clay loam topsoils combined with a FCD of 130 produce a potential ALC grade 1. Droughtiness is the main limitation in this area as a result of the high moisture deficits for wheat and potatoes producing moisture balances which can be graded no better than Grade 2. The profiles are typically medium clay loam topsoils to 30 cm and heavy clay loams to depth, occasionally with a lower subsoil clay horizon. Pit V is typical of these soils and showed moderate structural development and confirmed the low wetness status. Parts of the area experience topsoil erosion in the form of rills to several cm depth.

3.4 Grade 3a: Soil wetness is the critical factor for this 3a land. The soils are gleyed from the subsoil with slowly permeable layers from 35 cm and therefore fall into wetness class III; with a typical medium clay loam topsoil these soils may be graded no higher than 3a. A soil pit (Pit III) showed the subsoils had moderately developed coarse angular blocky structural units with low levels of porosity. With the clear evidence of wetness, these subsoils are slowly permeable. The topsoils were calcareous but this did not continue to depth and is therefore not a factor in the grading.

3.5 Grade 3b: The areas of grade 3b are made up of soils described in section 2.6, and suffer from a more significant wetness problem than the 3a soils. Pit I shows that the profiles possess clay and heavy clay loam topsoils,

which exhibit shallow gleying. Slowly permeable layers are present from 35 cm which place the soils into wetness class III and ALC grade 3b. The subsoil structure was weakly developed breaking into coarse sub-angular structural units with low porosity. In the north-east, locally steep gradients further limit the land to 3b.

Southern Area (South of Mill Road)

3.6 Grade 2

The majority of the land raised above the floodplain has been placed in this grade, the soils being those described in section 2.9. The soils are deep medium clay loams, gleyed in or immediately below the topsoil. The subsoils are of moderate structure, not being slowly permeable. The soils are thus assigned to wetness class II, which with medium clay loam topsoils and a FCD of 130, places these soils in grade 2 on soil wetness.

Soil droughtiness is also slightly limiting, due to the high moisture deficits for wheat and potatoes producing moisture balances which can be graded no better than grade 2. Pit VI is typical of these soils.

3.7 Grade 3a

A band of similar soils adjacent to the Grade 2 profiles exhibits a slightly more significant droughtiness limitation, due to very stony and gravelly subsoil below 70 cm, restricting the land to 3a.

In the floodplain, a minor area of 3a has been identified on a different soil type. This area exhibits a light topsoil (MSZL) developed over a deep stony subsoil (HCL, with up to 50% stone). Soil droughtiness limits these soils to sub-grade 3a. Pit IV is typical of these profiles.

Grade 3b:

On the higher land, an area of 3b identifies a stony shoulder where the subsoil structures and stone contents severely restrict the available water for roots in the profile. These soil are of the type described in section 2.10. Gravel layers (ie 70% stone) occur as horizons with soil resources below; pit 7 reveals that roots can penetrate deep into the profile.

Soil wetness is the main limitation on the floodplain 3b soils described in section 2.8. These areas have been placed into Wetness Class III due to shallow gleying and slowly permeable horizons. The heavy nature of the topsoils (HCL) causes a significant workability limitation, and the degree of profile waterlogging causes an important wetness limitation. Pit V is typical of these soils.

REFERENCES

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

MET. OFFICE (1989) Climatological Datasets for Agricultural Land Classification.

SOIL SURVEY OF ENGLAND AND WALES (1983), Sheet 6, Soils of South East England.

SOIL SURVEY OF ENGLAND AND WALES (1984), Bulletin 15, Soils and Their use in South East England.

BRITISH G GEOLOGICAL SURVEY, Sheets 272 and 289, Fordwich and Canterbury. Drift.