**A1**

# Canterbury District Local Plan
# RUR 6: Land west of Hersden.
# Agricultural Land Classification
# ALC Map and Report
# June 1995

# AGRICULTURAL LAND CLASSIFICATION REPORT

## CANTERBURY DISTRICT LOCAL PLAN
## RUR 6: LAND WEST OF HERSDEN.

### 1. Summary

1.1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality for a number of sites in the Canterbury district of Kent. The work forms part of MAFF's statutory input to the Canterbury District Local Plan.

1.2 The site comprises approximately 3 hectares of land to the north-east of the A28, west of the village of Hersden near Canterbury in Kent. An Agricultural Land Classification (ALC) survey was carried out during June 1995. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 2 borings and one soil inspection pit were described in accordance with MAFF's revised guidelines and criteria for grading *the quality of agricultural land (MAFF, 1988). These guidelines provide a framework for* classifying land according to the extent to which its physical or chemical characteristics impose a long term limitation on its use for agriculture.

1.3 The work was carried out by members of the Resource Planning Team in the Guildford Statutory Group of ADAS.

1.4 At the time of survey the agricultural land on the site comprised unmanaged rough grassland. The area mapped as urban includes private dwellings.

1.5 The distribution of grades and subgrades is shown on the attached ALC map and the areas and extent are given in the table below. The map has been drawn at a scale of 1:10,000. It is accurate at this scale, but any enlargement would be misleading.

**Table 1 : Distribution of Grades and Subgrades**

| Grade | Area (ha) | % of Site |
|---|---|---|
| 4 | 2.5 | 76.0 |
| Urban | 0.8 | 24.0 |
| Total area of site | 3.3 | 100% |

1.6 Appendix I gives a general description of the grades, subgrades and land use categories identified in the survey. The main classes are described in terms of the type of limitation that can occur, the typical cropping range and the expected level and consistency of yield.

1.7 All of the agricultural land on the site has been classified as Grade 4, poor quality land. Towards the eastern corner of the site, evidence of topsoil stripping having occurred was observed. The topsoil is an important soil resource and its absence will severely restrict the agricultural potential of this land. Elsewhere on the site, soil augerings proved impenetrable below the topsoil, and a subsequent soil inspection pit (pit 1) was dug to assess the nature of the subsoil. At the location of the pit, a medium clay loam topsoil and

heavy clay loam upper subsoil were found to overlie clay lower subsoils. The clay lower subsoils are slowly permeable, the described profile being assigned to Wetness Class IV with a resultant classification of Subgrade 3b. However, the occurrence of foreign material such as concrete rubble, glass and carpet fragments observed in the subsoils in the pit suggests that the soils have been disturbed, parts of the site have been subject to historical filling with subsoil materials originating from elsewhere. Therefore this land is classified as Grade 4 due to the limiting effect that pervious disturbance will have upon agricultural use.

## 2. Climate

2.1 The climatic criteria are considered first when classifying land as climate can be overriding in the sense that severe climatic limitations will restrict land to low grades irrespective of favourable site or soil conditions.

2.2 The main parameters used in the assessment of an overall climatic limitation are average annual rainfall, as a measure of overall wetness, and accumulated temperature (degree days Jan-June), as a measure of the relative warmth of a locality.

2.3 A detailed assessment of the prevailing climate was made by interpolation from a 5km gridpoint dataset (Met. Office 1989). The details are given in the table below and these show that there is no overall climatic limitation affecting the site.

2.4 However, climatic factors do interact with soil factors to influence soil wetness and droughtiness limitations. At this locality Average Annual Rainfall and Field Capacity Days are relatively low in a regional context, and therefore soil wetness problems may be diminished.

2.5 No local climatic factors such as exposure or frost risk are believed to affect the site.

**Table 2 : Climatic Interpolation**

| | |
|---|---|
| Grid Reference | TR 201 619 |
| Altitude (m) | 35 |
| Accumulated Temperature (Day °C, Jan-June) | 1454 |
| Average Annual Rainfall (mm) | 640 |
| Field Capacity (days) | 131 |
| Moisture Deficit, Wheat (mm) | 121 |
| Moisture Deficit, Potatoes (mm) | 118 |
| Overall Climatic Grade | 1 |

## 3. Relief

3.1 The site is flat, lying at an altitude of 35m.

## 4. Geology and Soils

4.1 The published geological map (BGS, 1974) shows the majority of the site to be underlain by Head Gravel, with smaller areas of Head Brickearth and London Clay mapped in the west.

4.2 The published Soil Survey map (SSEW, 1983) shows the soils on the site to comprise those of the Sonning 2 association. These are described as 'well drained flinty coarse loamy and gravelly soils associated with slowly permeable seasonally waterlogged fine loamy over clayey soils and coarse loamy over clayey soils with slowly permeable subsoils' (SSEW 1983).

4.3 Detailed field examination found loamy over clayey soils which had been the subject of disturbance.

## 5. Agricultural Land Classification

5.1 The location of the soil observation points are shown on the attached sample point map.

### Grade 4

5.4 Poor quality Grade 4 land has been mapped across the entire site, due to soil disturbance. Evidence of topsoil stripping was observed on part of the site, the removal of which has severely restricted the agricultural potential of the land. The remainder of the soils on the site are judged to have been disturbed, evidenced by the presence of foreign materials in the subsoil described at the pit. The described soil profile suggests that the land may have been subject to filling with foreign materials. The presence of foreign materials can restrict agricultural uses, such as in the case of mechanical cultivations. A lack of topsoil can also limit the agricultural potential of land. Topsoil is an important soil resource, as it is characterised by higher organic matter levels and greater biological activity. An absence of topsoil can inhibit plant growth, particularly crop and grassland establishment, and this will affect the level and consistency of yields. In the absence of any reliable historical information for the site, a classification of Grade 4 is appropriate.

ADAS Ref: 2002/50/95
MAFF Ref: EL 20/642

Resource Planning Team
Guildford Statutory Group
ADAS Reading

## SOURCES OF REFERENCE

British Geological Survey (1974), Sheet No. 273, Faversham, 1:50,000 Series (solid and drift edition).

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 (1983), Sheet 6: Soils of South East England, 1:250,000 and accompanying legend.

# APPENDIX I

## DESCRIPTION OF THE GRADES AND SUBGRADES

**Grade 1 : Excellent Quality Agricultural Land**

Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly includes top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality.

**Grade 2 : Very Good Quality Agricultural Land**

Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural or horticultural crops can usually be grown but on some land of this grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1 land.

**Grade 3 : Good to Moderate Quality Land**

Land with moderate limitations which affect the choice of crops, the timing and type of cultivation, harvesting or the level of yield. When more demanding crops are grown, yields are generally lower or more variable than on land in Grades 1 and 2.

**Subgrade 3a : Good Quality Agricultural Land**

Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.

**Subgrade 3b : Moderate Quality Agricultural Land**

Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass, or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.

**Grade 4 : Poor Quality Agricultural Land**

Land with severe limitations which significantly restrict the range of crops and/or the level of yields. It is mainly suited to grass with occasional arable crops (eg. cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

**Grade 5 : Very Poor Quality Agricultural Land**

Land with severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

**Urban**

Built-up or 'hard' uses with relatively little potential for a return to agriculture including: housing, industry, commerce, education, transport, religous buildings, cemetries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

**Non-agricultural**

'Soft' uses where most of the land could be returned relatively easily to agriculture, including: private parkland, public open spaces, sports fields, allotments and soft-surfaced areas on airports. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

**Woodland**

Includes commercial and non-commercial woodland. A distinction may be made as necessary between farm and non-farm woodland.

**Agricultural Buildings**

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (eg. polythene tunnels erected for lambing) may be ignored.

**Open Water**

Includes lakes, ponds and rivers as map scale permits.

**Land Not Surveyed**

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above, eg. buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will be shown.

# APPENDIX II

## FIELD ASSESSMENT OF SOIL WETNESS CLASS

### SOIL WETNESS CLASSIFICATION

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six soil wetness classes are identified and are defined in the table below.

**Definition of Soil Wetness Classes**

| Wetness Class | Duration of Waterlogging[1] |
|---|---|
| I | The soil profile is not wet within 70 cm depth for more than 30 days in most years.[2] |
| II | The soil profile is wet within 70 cm depth for 31-90 days in most years **or**, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 90 days, but only wet within 40 cm depth for 30 days in most years. |
| III | The soil profile is wet within 70 cm depth for 91-180 days in most years **or**, if there is no slowly permeable layer present within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31-90 days in most years. |
| IV | The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth for more than 210 days in most years **or**, if there is no slowly permeable layer present within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years. |
| V | The soil profile is wet within 40 cm depth for 211-335 days in most years. |
| VI | The soil profile is wet within 40 cm depth for more than 335 days in most years. |

Soils can be allocated to a wetness class on the basis of quantitative data recorded over a period of many years or by the interpretation of soil profile characteristics, site and climatic factors. Adequate quantitative data will rarely be available for ALC surveys and therefore the interpretative method of field assessment is used to identify soil wetness class in the field. The method adopted here is common to ADAS and the SSLRC.

[1]The number of days specified is not necessarily a continuous period.
[2]'In most years' is defined as more than 10 out of 20 years.

# APPENDIX III

## SOIL PIT AND SOIL BORING DESCRIPTIONS

**Contents :**

# SOIL PROFILE DESCRIPTIONS : EXPLANATORY NOTE

Soil pit and auger boring information collected during ALC fieldwork is held on a computer database. This uses notations and abbreviations as set out below.

**Boring Header Information**

1. **GRID REF** : national 100 km grid square and 8 figure grid reference.

2. **USE** : Land use at the time of survey. The following abbreviations are used.

| | | |
|---|---|---|
| **ARA** : Arable | **WHT** : Wheat | **BAR** : Barley |
| **CER** : Cereals | **OAT** : Oats | **MZE** : Maize |
| **OSR** : Oilseed rape | **BEN** : Field Beans | **BRA** : Brassicae |
| **POT** : Potatoes | **SBT** : Sugar Beet | **FCD** : Fodder Crops |
| **LIN** : Linseed | **FRT** : Soft and Top Fruit | **FLW** : Fallow |
| **PGR** : Permanent Pasture | **LEY** : Ley Grass | **RGR** : Rough Grazing |
| **SCR** : Scrub | **CFW** : Coniferous Woodland | **DCW** : Deciduous Wood |
| **HTH** : Heathland | **BOG** : Bog or Marsh | **FLW** : Fallow |
| **PLO** : Ploughed | **SAS** : Set aside | **OTH** : Other |
| **HRT** : Horticultural Crops | | |

3. **GRDNT** : Gradient as estimated or measured by a hand-held optical clinometer.

4. **GLEY/SPL** : Depth in centimetres (cm) to gleying and/or slowly permeable layers.

5. **AP (WHEAT/POTS)** : Crop-adjusted available water capacity.

6. **MB (WHEAT/POTS)** : Moisture Balance. (Crop adjusted AP - crop adjusted MD)

7. **DRT** : Best grade according to soil droughtiness.

8. If any of the following factors are considered significant, 'Y' will be entered in the relevant column.

| | | |
|---|---|---|
| **MREL** : Microrelief limitation | **FLOOD** : Flood risk | **EROSN** : Soil erosion risk |
| **EXP** : Exposure limitation | **FROST** : Frost prone | **DIST** : Disturbed land |
| **CHEM** : Chemical limitation | | |

9. **LIMIT** : The main limitation to land quality. The following abbreviations are used.

| | | |
|---|---|---|
| **OC** : Overall Climate | **AE** : Aspect | **EX** : Exposure |
| **FR** : Frost Risk | **GR** : Gradient | **MR** : Microrelief |
| **FL** : Flood Risk | **TX** : Topsoil Texture | **DP** : Soil Depth |
| **CH** : Chemical | **WE** : Wetness | **WK** : Workability |
| **DR** : Drought | **ER** : Erosion Risk | **WD** : Soil Wetness/Droughtiness |
| **ST** : Topsoil Stoniness | | |

**Soil Pits and Auger Borings**

1. **TEXTURE** : soil texture classes are denoted by the following abbreviations.

| | | | | | |
|---|---|---|---|---|---|
| **S** : | Sand | **LS** : | Loamy Sand | **SL** : | Sandy Loam |
| **SZL** : | Sandy Silt Loam | **CL** : | Clay Loam | **ZCL** : | Silty Clay Loam |
| **ZL** : | Silt Loam | **SCL** : | Sandy Clay Loam | **C** : | Clay |
| **SC** : | Sandy Clay | **ZC** : | Silty Clay | **OL** : | Organic Loam |
| **P** : | Peat | **SP** : | Sandy Peat | **LP** : | Loamy Peat |
| **PL** : | Peaty Loam | **PS** : | Peaty Sand | **MZ** : | Marine Light Silts |

For the sand, loamy sand, sandy loam and sandy silt loam classes, the predominant size of sand fraction will be indicated by the use of the following prefixes:

**F** : Fine (more than 66% of the sand less than 0.2mm)
**M** : Medium (less than 66% fine sand and less than 33% coarse sand)
**C** : Coarse (more than 33% of the sand larger than 0.6mm)

The clay loam and silty clay loam classes will be sub-divided according to the clay content: **M** : Medium (<27% clay) **H** : Heavy (27-35% clay)

2. **MOTTLE COL** : Mottle colour using Munsell notation.

3. **MOTTLE ABUN** : Mottle abundance, expressed as a percentage of the matrix or surface described.

**F** : few <2% **C** : common 2-20% **M** : many 20-40% **VM** : very many 40% +

4. **MOTTLE CONT** : Mottle contrast

**F** : faint - indistinct mottles, evident only on close inspection
**D** : distinct - mottles are readily seen
**P** : prominent - mottling is conspicuous and one of the outstanding features of the horizon

5. **PED. COL** : Ped face colour using Munsell notation.

6. **GLEY** : If the soil horizon is gleyed a 'Y' will appear in this column. If slightly gleyed, an 'S' will appear.

7. **STONE LITH** : Stone Lithology - One of the following is used.

| | | | |
|---|---|---|---|
| **HR** : | all hard rocks and stones | **SLST** : | soft oolitic or dolimitic limestone |
| **CH** : | chalk | **FSST** : | soft, fine grained sandstone |
| **ZR** : | soft, argillaceous, or silty rocks | **GH** : | gravel with non-porous (hard) stones |
| **MSST** : | soft, medium grained sandstone | **GS** : | gravel with porous (soft) stones |
| **SI** : | soft weathered igneous/metamorphic rock | | |

Stone contents (>2cm, >6cm and total) are given in percentages (by volume).

8. **STRUCT** : the degree of development, size and shape of soil peds are described using the following notation:

| | | |
|---|---|---|
| degree of development | **WK** : weakly developed<br>**ST** : strongly developed | **MD** : moderately developed |
| ped size | **F** : fine<br>**C** : coarse | **M** : medium<br>**VC** : very coarse |
| ped shape | **S** : single grain<br>**GR** : granular<br>**SAB** : sub-angular blocky<br>**PL** : platy | **M** : massive<br>**AB** : angular blocky<br>**PR** : prismatic |

9. **CONSIST** : Soil consistence is described using the following notation:

**L** : loose **VF** : very friable **FR** : friable **FM** : firm **VM** : very firm
**EM** : extremely firm **EH** : extremely hard

10. **SUBS STR** : Subsoil structural condition recorded for the purpose of calculating profile droughtiness : **G** : good **M** : moderate **P** : poor

11. **POR** : Soil porosity. If a soil horizon has less than 0.5% biopores >0.5 mm, a 'Y' will appear in this column.

12. **IMP** : If the profile is impenetrable to rooting a 'Y' will appear in this column at the appropiate horizon.

13. **SPL** : Slowly permeable layer. If the soil horizon is slowly permeable a 'Y' will appear in this column.

14. **CALC** : If the soil horizon is calcareous, a 'Y' will appear in this column.

15. Other notations
**APW** : available water capacity (in mm) adjusted for wheat
**APP** : available water capacity (in mm) adjusted for potatoes
**MBW** : moisture balance, wheat
**MBP** : moisture balance, potatoes

SOIL PIT DESCRIPTION

Site Name : CANTERBURY LP RUR 6 Pit Number : 1P

Grid Reference: TR20016194
Average Annual Rainfall : 640 mm
Accumulated Temperature : 1454 degree days
Field Capacity Level : 131 days
Land Use : Set-aside
Slope and Aspect : degrees

| HORIZON | TEXTURE | COLOUR | STONES >2 | TOT.STONE | LITH | MOTTLES | STRUCTURE | CONSIST | SUBSTRUCTURE | CALC |
|---|---|---|---|---|---|---|---|---|---|---|
| 0- 22 | MZCL | 10YR42 52 | 5 | 10 | HR | C | | | | |
| 22- 28 | HCL | 25Y 41 51 | 0 | 15 | HR | C | | | M | |
| 28- 80 | C | 25Y 42 00 | 0 | 25 | HR | C | | FM | P | |
| 80-100 | C | 25Y 52 00 | 0 | 20 | HR | F | | | M | |

Wetness Grade : 3B
Wetness Class : IV
Gleying : 0 cm
SPL : 28 cm

Drought Grade : 3B
APW : 097mm MBW : -24 mm
APP : 088mm MBP : -30 mm

FINAL ALC GRADE : 4
MAIN LIMITATION :

| SAMPLE NO. | GRID REF | ASPECT USE | GRDNT | GLEY | SPL | --WETNESS-- CLASS | GRADE | -WHEAT- AP | MB | -POTS- AP | MB | M.REL DRT | FLOOD | EROSN EXP | FROST DIST | CHEM LIMIT | ALC | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | TR20016194 | SAS | | 0 | | 2 | 2 | 043 | -78 | 043 | -75 | 4 | | | Y | DI | 4 | DISTURBED |
| 1P | TR20016194 | SAS | | 0 | 28 | 4 | 3B | 097 | -24 | 088 | -30 | 3B | | | Y | DI | 4 | DISTURBED |
| 2 | TR20026193 | SAS | | 0 | | 2 | 2 | 042 | -79 | 042 | -76 | 4 | | | Y | DI | 4 | DISTURBED |

| SAMPLE | DEPTH | TEXTURE | COLOUR | ----MOTTLES----- COL | ABUN | CONT | PED COL. | GLEY | ----STONES---- >2 | >6 | LITH | TOT | STRUCT/ CONSIST | SUBS STR | POR | IMP | SPL | CALC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0-25 | mzcl | 10YR42 52 | 10YR56 00 | C | | | Y | 5 | 0 | HR | 10 | | | | | | | IMP FLINTS 25 |
| 1P | 0-22 | mzcl | 10YR42 52 | 10YR56 00 | C | | | Y | 5 | 0 | HR | 10 | | | | | | | |
| | 22-28 | hcl | 25Y 41 51 | 10YR56 00 | C | | | Y | 0 | 0 | HR | 15 | | M | | | | | BRICK FRAGS |
| | 28-80 | c | 25Y 42 00 | 10YR58 00 | C | | | Y | 0 | 0 | HR | 25 | | FM | P | Y | | | CARPET, GLASS |
| | 80-100 | c | 25Y 52 00 | 25Y 58 00 | F | | | Y | 0 | 0 | HR | 20 | | M | | | | | |
| 2 | 0-20 | zl | 10YR52 00 | 10YR56 00 | C | | | Y | 2 | 0 | HR | 10 | | | | | | | IMP FLINTS 20 |