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Canterbury District Local Plan
Land at Folly Farm,
Canterbury, Kent.
Agricultural Land Classification
ALC Map and Report
March 1995

AGRICULTURAL LAND CLASSIFICATION REPORT

CANTERBURY DISTRICT LOCAL PLAN.
LAND AT FOLLY FARM, CANTERBURY, KENT.

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 district of Canterbury in Kent. The work forms part of MAFF's statutory input to the preparation of the Canterbury District Local Plan.

1.2 The site comprises 4.37 hectares of land at Folly Farm, Canterbury, Kent. An Agricultural Land Classification (ALC) survey was carried out in March 1995. The survey was undertaken at a detailed level of approximately one boring per hectare of agricultural land. A total of 5 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 survey work was carried out by members of the Resource Planning Team in the Guildford Statutory Group of ADAS.

1.4 At the time of the survey the agricultural land on the site comprised permanent grassland. An area of Agricultural Buildings and a strip of Woodland has been mapped on the site.

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	% of Agricultural Land
3a	1.4	31.8	35.9
3b	2.1	47.8	53.8
4	0.4	9.1	10.3
Woodland	0.1	2.2	100%(3.9ha)
Non-Agricultural	0.4	9.1	
Total area of Site	4.4	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 The lower section of the site is classified as Subgrade 3a, good quality land, with soil wetness as the main limitation. Soil profiles typically comprise Medium clay and Medium silty clay loams over clay subsoils. Profiles show evidence of soil wetness at moderate depth related to clay subsoils that are poor to moderately structured and slowly permeable. The majority of the high ground on the site has been classified as Subgrade 3b, moderate quality land, with soil wetness as the main limitation. Soil profiles typically comprise deep clay soils. Profiles show clear evidence of soil wetness at shallow depth related to clay subsoils that are poorly structured and slowly permeable. Poorly drained, wet soils such as these restrict plant growth and development and may be more susceptible to structural damage through trafficking by agricultural machinery or poaching by grazing livestock. A small section of the main slope has been classified as Grade 4 with gradient as the main limitation. The slope, measured at 12 degrees, reduces the amount of conventional farm machinery which can safely cultivate the land.

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 the climate is relatively warm and moist, which may increase the likelihood of soil wetness limitations.

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 157 596	TR156 599
Altitude (m)	10	40
Accumulated Temperature (degree days, Jan-June)	1485	1450
Average Annual Rainfall (mm)	610	628
Field Capacity (days)	129	131
Moisture Deficit, Wheat (mm)	125	120
Moisture Deficit, Potatoes (mm)	122	117
Overall Climatic Grade	1	1

3. Relief

3.1 The site is flat, lying at an altitude of approximately 40-10m AOD.

4. Geology and Soils

4.1 The relevant geological map (BGS, 1982) shows the site to be underlain by London Clay at the top of the slope, a narrow band of Oldhaven Beds on the steepest part of the slope, Head on the lower slopes with Head Brickearth to the South of the farm buildings.

4.2 The published Soil Survey map (SSEW, 1983) shows the soils on the site to comprise those of the Hamble and Wickham 4 associations. Hamble associations are described as 'Deep well drained often stoneless fine silty soils. Some similar oils affected by ground water and some fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging. Some shallower soils over chalk'. Wickham 4 associations are described as 'slowly permeable seasonally waterlogged fine loamy over clayey, fine silty over clayey and clayey soils' (SSEW, 1983).

4.3 Detailed field examination found the soils on the site to be clayey with slowly permeable subsoils.

5. Agricultural Land Classification

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

Subgrade 3a

5.2 The majority of the lower ground (1.4ha) has been classified as Subgrade 3a, due to a soil wetness limitation. Soil profiles were found to comprise silty clay loam and clay loam topsoils over similar and clay subsoils. Profiles show evidence of imperfect drainage in the form of gleying throughout the subsoils. A soil inspection pit (pit 1) showed the clay lower subsoil to be poorly structured with low porosity from below the upper subsoil, therefore it is classified as a slowly permeable layer which will impede soil drainage. The presence of gleying and the moderate depth to the slowly permeable layer means that these soils are assigned to Wetness Class III with the resultant classification of Subgrade 3a.

Subgrade 3b

5.3 The lower slopes and the are at the top of the site (2.1ha) have been classified as Subgrade 3b, due to a significant soil wetness limitation. Soil profiles were found to comprise deep clays. Profiles show evidence of imperfect drainage in the form of gleying from the topsoil down. Based on the evidence from pit 1, the clay was assumed to have a low porosity and a poorly developed structure directly below the topsoil and is therefore classified as a slowly permeable layer which will significantly impede drainage. The presence of gleying and the shallow depth to the slowly permeable layer means that these soils are assigned to no better than Wetness Class IV, with a resultant classification of Subgrade 3b. Poorly drained wet soils can inhibit plant and root development, and may be more susceptible to

structural damage through trafficking by agricultural machinery or poaching by grazing livestock.

Grade 4

5.4 A small section of the main slope (0.4ha) has been classified as Grade 4 with the gradient as the main limitation. The slope, measured at 12 degrees reduces the amount of conventional farm machinery which can safely cultivate the land. Where cultivation is involved, there is often an attendant risk of soil erosion particularly if the soil is weakly structured.

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Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1982), Sheet No. 289, Canterbury, 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 **ST** : strongly developed	**MD** : moderately developed
ped size	**F** : fine **C** : coarse	**M** : medium **VC** : very coarse
ped shape	**S** : single grain **GR** : granular **SAB** : sub-angular blocky **PL** : platy	**M** : massive **AB** : angular blocky **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 CAN 21 Pit Number : 1P

Grid Reference: TR15665964 Average Annual Rainfall : 610 mm
Accumulated Temperature : 1485 degree days
Field Capacity Level : 129 days
Land Use : Permanent Grass
Slope and Aspect : degrees S

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 25	MCL	10YR32 00	0	1	HR					
25- 50	HCL	10YR52 00	0	2	HR	M	MCSAB	FR	M	
50- 70	C	25Y 63 00	0	0		M			P	

Wetness Grade : 3A Wetness Class : III
Gleying : 25 cm
SPL : 50 cm

Drought Grade : 3B APW : 098mm MBW : -27 mm
APP : 110mm MBP : -12 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Wetness

program: ALC012 LIST OF BORINGS HEADERS 26/06/95 CANTERBURY LP CAN 21 page 1

SAMPLE NO.	GRID REF	ASPECT USE		GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M.REL DRT	FLOOD	EXP	EROSN DIST	FROST LIMIT	CHEM	ALC	COMMENTS
1	TR15655995	PGR	SW	02	0	25	3	3B	000	0	000	0					WE		3B	POACHED FIELD
1P	TR15665964	PGR	S		25	50	3	3A	098	-27	110	-12	3B				WE		3A	WATER @ 50 QWC
2	TR15565989	PGR	SW	04	20	20	3	3B	000	0	000	0					WE		3B	V WET U/FOOT
3	TR15665964	PGR	S		22	22	3	3A	083	-42	089	-33	3B				WE		3A	
4	TR15675960	PGR	S		30	50	3	3A	100	-25	112	-10	3B				WE		3A	
5	TR15735962	PGR	S		45	90	1	1	145	20	119	-3	2				DR		2	

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL.	GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC
1	0-25	c	25Y 41 00	10YR46 00	C			Y	0	0	HR	10						
	25-35	c	25Y 51 00	10YR58 00	M			Y	0	0	HR	10		P			Y	
	35-60	c	05Y 51 00	10YR58 00	M			Y	0	0		0		P			Y	
1P	0-25	mcl	10YR32 00						0	0	HR	1						
	25-50	hcl	10YR52 00	75YR56 00	M			Y	0	0	HR	2	MCSAB FR	M				
	50-70	c	25Y 63 00	75YR56 00	M		00MN00 00	Y	0	0		0		P	Y		Y	
2	0-20	c	25Y 41 00	10YR46 00	C			Y	0	0	HR	5						
	20-40	c	05Y 41 51	10YR58 00	M			Y	0	0	HR	10		P			Y	
	40-60	c	05Y 41 51	10YR58 00	M			Y	0	0		0		P			Y	
3	0-22	mcl	10YR42 00						0	0		0						
	22-60	c	10YR56 00	75YR58 00	C			Y	0	0		0		P			Y	
4	0-30	mcl	10YR42 00	00					0	0		0						
	30-50	hcl	25 Y63 00	000C00 00	M			Y	0	0		0		M				
	50-70	c	25Y 63 00	000C00 00	M			Y	0	0		0		P	Y		Y	
5	0-30	mzcl	10YR32 00						0	0	HR	5						
	30-45	mzcl	10YR42 00	10YR56 00	F				0	0	HR	5		M				
	45-80	mzcl	25Y 53 00	10YR66 00	C			Y	0	0	HR	5		M				
	80-90	hzcl	25Y 63 00	10YR58 68	M			Y	0	0	HR	5		M				
	90-120	c	25Y 63 00	10YR68 00	M			Y	0	0	HR	5		P			Y	