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Canterbury District Local Plan
CAN 14: Land at Ridlands Farm
ALC Map and Report
March 1995

AGRICULTURAL LAND CLASSIFICATION REPORT

CANTERBURY DISTRICT LOCAL PLAN
CAN 14: RIDLANDS FARM

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 land at Ridlands Farm comprises 6.8 hectares of land to the south of Ridlands Farm, between the A2 and the A2050, to the south of Canterbury, Kent. An Agricultural Land Classification (ALC) survey was carried out during March 1995. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 8 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 the survey the land was growing cereals. Land mapped as urban comprises a metalled path.

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. This survey supersedes previous ALC surveys on this land.

Table 1 : Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site
2	6.6	97.1
Urban	0.2	2.9
Total area of site	6.8	100.0

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 surveyed has been classified as Grade 2, very good quality, because of slight soil droughtiness limitations. Medium silty clay loam topsoils generally overlie similarly textured subsoils which occasionally are slightly

heavier. Adjacent to the northern and eastern site boundaries, where the land is slightly higher, profiles with slightly flinty topsoils and upper subsoils pass into chalky lower subsoils. Elsewhere, soil profiles contain few flints but no chalky material. The interaction between the silty textured soils and stone contents with the relatively dry local climate means that all of this land is prone to a slight risk of drought. Consequently this land will suffer from slightly lower and less consistent crop yields.

2. Climate

2.1 The climatic criteria are considered first when classifying land as climate can be overriding in the sense that severe 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, 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. However climatic factors do interact with soil factors to influence soil wetness and droughtiness limitations. The soil moisture deficits are relatively high, in a regional context, at this locality. High soil moisture deficits increase the likelihood of soil droughtiness limitations.

Table 2 : Climatic Interpolation

Grid Reference	TR 153 560
Altitude (m)	45
Accumulated Temperature (degree days, Jan-June)	1447
Average Annual Rainfall (mm)	701
Field Capacity (days)	146
Moisture Deficit, Wheat (mm)	115
Moisture Deficit, Potatoes (mm)	110
Overall Climatic Grade	1

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

3. Relief

3.1 The northern and eastern site boundaries lie at approximately 45 m AOD, whereas the remainder of the site occupies very slightly lower lying land.

4. Geology and Soil

4.1 The relevant geological sheet (BGS, 1982) shows the entire site to be underlain by Upper Chalk.

4.2 The most recent published soils information (SSEW, 1983) shows the entire site to comprise soils of the Coombe 1 Association. These soils are described as 'well drained calcareous fine silty soils, deep in valley bottoms, shallow to chalk on valley sides in places'. The soils for this area are similarly described in the Soils of Kent (SSEW, 1980).

4.3 Detailed field examination found well drained silty textured soils which pass into chalky lower subsoils where the land on the site is slightly higher lying.

5. Agricultural Land Classification

5.1 Table 1 provides the details of the area measurements for each grade and the distribution of each grade is shown on the attached ALC map.

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

Grade 2

5.3 Land classified as Grade 2, very good quality, is limited by slight soil droughtiness. Non-calcareous medium silty clay loam topsoils generally overlie similarly textured subsoils. Occasionally subsoils are slightly heavier, typically heavy silty clay loams and clays. Profiles are well drained (Wetness Class I).

5.4 Topsoils are slightly stony, containing 1-3% of flints larger than 2 cm and 3-8% total flints by volume. In the extreme north of the site there is a discrete area which contains approximately 5% of flints larger than 6 cm within the top 25 cm. Consequently this land is classified as Subgrade 3a because of topsoil stone limitations. However, the limited areal extent of land subject to such topsoil stoniness means that this area has not been delineated as a separate mapping unit.

5.5 On the slightly lower lying land on the site the subsoils are similarly stony to the topsoils, containing 1-10% total flints by volume. Adjacent to the northern and eastern site boundaries the upper subsoils also contain approximately 1-10% total flints. However, these profiles pass into lower horizons of weathered chalk at approximately 45 cm depth. When augured it was thought that these profiles then passed into pure chalk lower subsoils. Consequently, Pit 1 was dug to assess rooting depth into the chalk. However, from Pit 1 it could be seen that although the lower subsoils contain pockets of pure chalk overall these lower horizons contain only about 40% chalk and represent a soil resource that could be exploited by roots. It has thus been assumed that borings to the west and south of this pit also overlie weathered, rather than pure, chalk.

5.6 The interaction between the soil properties (textures, moderately structured subsoils and stone contents) with the relatively dry local climate causes the amount of profile water to be slightly restricted. The resultant soil droughtiness limitations will produce slightly lowered levels and consistency of crop yields through risk of drought stress.

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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 (1980), Bulletin No. 9, Soils of Kent and accompanying maps at 1:250,000.

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 14 Pit Number : 1P

Grid Reference: TR15495608 Average Annual Rainfall : 701 mm
Accumulated Temperature : 1447 degree days
Field Capacity Level : 146 days
Land Use : Cereals
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 29	MZCL	10YR43 00	2	3	HR					
29- 39	HZCL	10YR43 00	0	15	HR	C	MDCSAB	FR	M	
39- 46	C	10YR53 42	0	15	HR	C	WKCSAB	FM	P	
46-100	HZCL	10YR64 00	0	40	CH				M	Y

Wetness Grade : 2 Wetness Class : II
Gleying :039 cm
SPL : No SPL

Drought Grade : 2 APW : 126mm MBW : 11 mm
APP : 110mm MBP : 0 mm

FINAL ALC GRADE : 2
MAIN LIMITATION : Droughtiness

SAMPLE NO.	GRID REF	USE	ASPECT 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	TR15305620	CER				1	1	100	-15	110	0	3A				ST	3A		Impen70 chalky
1P	TR15495608	CER		039		2	2	126	11	110	0	2				DR	2		Chlky drift 46
2	TR15205610	CER				1	1	150	35	116	6	2				DR	2		Not chalky
3	TR15305610	CER				1	1	121	6	120	10	2				DR	2		Impen85 flint
4	TR15405610	CER				1	1	109	-6	115	5	3A				DR	2		Impen75 chalky
5	TR15495608	CER				1	1	103	-12	112	2	3A				DR	2		Impen70 chalky
6	TR15205600	CER		060		1	1	144	29	121	11	2				DR	2		Imp flints 110
7	TR15305600	CER				1	1	153	38	119	9	2				DR	2		Not chalky
8	TR15405600	CER				1	1	91	-24	94	-16	3B				DR	2		Impen60 chalky

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	0-20	mzcl	10YR42 00						0	5	HR	10							
	20-35	mzcl	10YR43 00						0	0	HR	3		M					
	35-40	mzcl	10YR43 00						0	0	CH	35		M				Y	
	40-60	mzcl	10YR64 00						0	0	CH	2		M					
	60-70	ch	10YR81 00						0	0	HR	1		M				Y	Chalky drift (1P)
1P	0-29	mzcl	10YR43 00						2	0	HR	3							
	29-39	hzcl	10YR43 00	10YR58 00	C			S	0	0	HR	15	MDCSAB	FR M					Sl. gleyed
	39-46	c	10YR53 42	10YR58 00	C			Y	0	0	HR	15	WKCSAB	FM P					
	46-100	hzcl	10YR64 00						0	0	CH	40		M				Y	Chalky drift
2	0-26	mzcl	10YR42 00						3	0	HR	5							
	26-60	mzcl	75YR54 00						0	0	HR	10		M					
	60-120	mzcl	75YR54 00						0	0	HR	5		M					
3	0-26	mzcl	10YR42 43						3	0	HR	5							
	26-40	mzcl	10YR54 00						0	0	HR	2		M					
	40-85	mzcl	10YR54 56						0	0	HR	2		M					Impen 85 flint
4	0-28	mzcl	10YR32 42						1	0	HR	3							
	28-48	hzcl	10YR54 00						0	0	CH	5		M					
	48-60	hzcl	10YR64 00						0	0	CH	35		M				Y	
	60-75	hzcl	10YR64 00						0	0	CH	60		M				Y	Impen 75 chalky
5	0-25	mzcl	10YR42 00						1	0	HR	3							
	25-40	hzcl	10YR42 43						0	0	HR	1		M					
	40-50	c	10YR43 00						0	0	HR	1		M					
	50-60	hzcl	10YR43 00						0	0	CH	35		M				Y	
	60-70	ch	10YR81 00						0	0	HR	1		M				Y	Chalky drift (1P)
6	0-30	mzcl	10YR32 42						3	0	HR	8							
	30-60	mzcl	10YR54 00	10YR56 00	F				0	0		0		M					
	60-100	mzcl	10YR53 52	10YR56 00	C		00MN00 00	Y	0	0		0		M					
	100-110	mzcl	10YR53 52	10YR56 00	C		00MN00 00	Y	0	0	HR	30		M					Impen 110 flinty
7	0-30	mzcl	10YR43 00						1	0	HR	5							
	30-120	mzcl	10YR44 54	00MN00 00	F				0	0	HR	5		M					
8	0-25	mzcl	10YR42 00						2	0	HR	4							
	25-45	hzcl	10YR54 00						0	0	CH	2		M					
	45-60	ch	10YR81 00						0	0	HR	1		M				Y	Chalky drift (1P)