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LAND WEST OF DOVER ROAD, DEAL
KENT
AGRICULTURAL LAND CLASSIFICATION
ALC MAP AND REPORT
AUGUST 1993

LAND WEST OF DOVER ROAD, DEAL, KENT

AGRICULTURAL LAND CLASSIFICATION, REPORT

1. SUMMARY

- 1.1 In August 1993, a detailed Agricultural Land Classification (ALC) survey was made on 4.1 hectares of land west of Dover Road, Deal, Kent.
- 1.2 The work was conducted by the Resource Planning Team in the Guildford Statutory Group of ADAS in response to a commission by MAFF's Land Use Planning Unit to provide information on the quality of agricultural land affected by proposals for a petrol station, foodstore and associated facilities.
- 1.3 The classification has been made using 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 long-term limitations on its use for agriculture.
- 1.4 The fieldwork was carried out at an observation density of just over one boring per hectare. A total of six soil auger borings and one soil inspection pit were examined.
- 1.5 The table below provides details of the grades found across the site. Land is classified as good quality subgrade 3a. The key limitation is droughtiness due to the occurrence of chalk in the subsoil limiting available water for plant growth.

Table 1 : Distribution of Grades and Sub-grades

<u>Grade</u>	<u>Area (ha)</u>	<u>% of Site</u>	<u>% of Agricultural Area</u>
3A	<u>4.1</u>	100	100
Total Area of Site	4.1		

- 1.6 The distribution of the ALC grades is shown on the attached ALC map. The information is presented at a scale of 1:5000; it is accurate at this scale but any enlargement would be misleading.
- 1.7 At the time of survey the land was in cereals.
- 1.8 A general description of the grades and sub-grades is provided as an appendix. 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.
- #### 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 the overall climatic limitation are annual average 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 5 km 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 No local climatic factors such as exposure or frost risk affect the site.

Table 2 : Climatic Interpolation

Grid Reference:	TR 364 494
Altitude (m):	45
Accumulated Temperature (°days):	1445
Average Annual Rainfall (mm):	750
Field Capacity (days):	156
Moisture Deficit, Wheat (mm):	114
Moisture Deficit, Potatoes (mm):	109
Overall Climatic Grade:	1

3. RELIEF

- 3.1 The site lies at an approximate altitude of 40-45 m AOD, land sloping gently north west from the point of highest altitude. Nowhere on the site do altitude or relief affect agricultural land quality.

4. GEOLOGY AND SOIL

- 4.1 The published geological map sheet 290 (BGS, 1977) shows the underlying geology for the site to be Cretaceous Upper Chalk.
- 4.2 The published soils map sheet 6 (SSEW, 1983) shows the site to be mapped as Coombe 1 Association - "Well drained calcareous fine silty soils, deep in valley bottoms, shallow to chalk on valley sides in places" (SSEW, 1983).
- 4.3 A detailed examination of soils on the site confirmed the presence of shallow silty soils over chalk.

5. AGRICULTURAL LAND CLASSIFICATION

- 5.1 The table in paragraph 1.5 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 is shown on the attached Sample Point map.

Subgrade 3A

- 5.3 The site is classified as good quality, subgrade 3A, agricultural land. Profiles are calcareous throughout and comprise topsoils of medium silty clay loam containing, in total, 2-12% chalk stones by volume with occasional flints. This passes to chalk at a depth of between 28-35 cm. Occasionally there is a thin horizon of medium silty clay loam containing a total of 50% chalk before passing to pure chalk below. Soil pit information (soil pit 1P) revealed the presence of soft easily rootable chalk. Effective rooting depth into the chalk was found to be 52 cm. Profiles are well drained but due to the close proximity of chalk to the surface interacting with the depth of rooting and the climate for the locality land suffers from a droughtiness limitation and is classified as subgrade 3A.

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Resource Planning Team
Guildford Statutory Group
ADAS Reading

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 on the 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.

Grade 3 : Good To Moderate Quality Agricultural Land

Land with moderate limitations which affect the choice of crops, 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.

Sub-grade 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.

Sub-grade 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 very 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 : housing, industry, commerce, education, transport, religious buildings, cemeteries. 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/airfields. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

Woodland

Includes commercial and non-commercial 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

SOURCES OF REFERENCE

BRITISH GEOLOGICAL SURVEY, 1977. Geology Map Sheet 290 Dover. Solid and Drift Edition. 1:50,000 scale.

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

METEOROLOGICAL OFFICE, 1989. Climatological datasets for agricultural land classification.

SOIL SURVEY OF ENGLAND AND WALES, 1983. Soils map sheet 6 "Soils of South East England". 1:250,000 scale and accompanying legend.

APPENDIX III

DEFINITION OF SOIL WETNESS CLASSES

Wetness Class I

The soil profile is not wet within 70cm depth for more than 30 days in most years.

Wetness Class II

The soil profile is wet within 70cm depth for 31-90 days in most years or, if there is no slowly permeable layer within 80cm depth, it is wet within 70cm for more than 90 days, but not wet within 40cm depth for more than 30 days in most years.

Wetness Class III

The soil profile is wet within 70cm depth for 91-180 days in most years or, if there is no slowly permeable layer within 80cm depth, it is wet within 70cm for more than 180 days, but only wet within 40cm depth for 31-90 days in most years.

Wetness Class IV

The soil profile is wet within 70cm depth for more than 180 days but not wet within 40cm depth for more than 210 days in most years or, if there is no slowly permeable layer within 80cm depth, it is wet within 40cm depth for 91-210 days in most years.

Wetness Class V

The soil profile is wet within 40cm depth for 211-335 days in most years.

Wetness Class VI

The soil profile is wet within 40cm depth for more than 335 days in most years.

(The number of days is not necessarily a continuous period. 'In most years' is defined as more than 10 out of 20 years.)

APPENDIX IV

SOIL PIT AND SOIL BORING DESCRIPTIONS

- Contents :
- * Soil Abbreviations : Explanatory Note
 - * Database Printout : Boring Level Information
 - * Database Printout : Horizon Level Information

SOIL PROFILE DESCRIPTIONS : EXPLANATORY NOTE

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

Boring Header Information

1. **GRID REF** : national 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 **HRT** : Horticultural Crops **PGR** : Permanent Pasture **LEY** : Ley Grass **RGR** : Rough Grazing
SCR : Scrub **CFW** : Coniferous Woodland **DCW** : Deciduous Woodland **HTH** : Heathland **BOG** : Bog or Marsh
FLW : Fallow **PLO** : Ploughed **SAS** : Set aside **OTH** : Other

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

4. **GLEYSPL** : Depth in cm to gleying or slowly permeable layers.

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

6. **MB (WHEAT/POTS)** : Moisture Balance.

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

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

MREL : Microrelief limitation **FLOOD** : Flood risk **EROSN** : Soil erosion risk **EXP** : Exposure limitation **FROST** : Frost
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** : Soil Erosion Risk **WD** : Combined 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
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 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

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

6. **STONE LITH** : One of the following is used.

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

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

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

- degree of development WK : weakly developed MD : moderately developed ST : strongly developed

- ped size F : fine M : medium C : coarse VC : very coarse

- ped shape S : single grain M : massive GR : granular AB : angular blocky SAB : sub-angular blocky PR : prismatic
PL : platy

8. **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

9. **SUBS STR** : Subsoil structural condition recorded for the purpose of calculating profile droughtiness.

G : good M : moderate P : poor

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

11. **IMP** : If the profile is impenetrable a 'Y' will appear in this column at the appropriate horizon.

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

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

14. 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

SAMPLE NO.	GRID REF	ASPECT USE	GRDNT	SPL	--WETNESS--		-WHEAT-		-POTS-		M.REL		EROSN	FROST	CHEM	ALC	COMMENTS
					CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT		
1	TR36404950	CER NW	03		1	1	99	-15	95	-14	3A				DR	3A	ROOTS 84
1P	TR36454944	CER NW	03		1	1	96	-18	93	-16	3A				DR	3A	ROOTS 82
2	TR36504950	CER NW	03		1	1	96	-18	94	-15	3A				DR	3A	ROOTS 82
3	TR36404940	CER NW	03		1	1	97	-17	94	-15	3A				DR	3A	ROOTS 82
4	TR36504940	CER NW	03		1	1	101	-13	96	-13	3A				DR	3A	ROOTS 87
5	TR36554956	CER NW	03		1	1	93	-21	92	-17	3B				DR	3B	ROOTS 80
6	TR36334932	CER NW	03		1	1	104	-10	98	-11	3A				DR	3A	ROOTS 87

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----			PED COL.	----STONES----			STRUCT/ CONSIST	SUBS STR POR IMP	SPL	CALC
				COL	ABUN	CONT		GLEY	>2	>6				
1	0-32	mc1	10YR43 00					0	0	CH	2			Y
	32-84	ch	00CH00 00					0	0	HR	0	P		Y
1P	0-30	mzc1	10YR53 00					3	0	CH	13			Y
	30-82	ch	00CH00 00					0	0	HR	0	P		Y
2	0-30	mzc1	10YR53 00					2	0	CH	12			Y
	30-82	ch	00CH00 00					0	0	HR	0	P		Y
3	0-30	mzc1	10YR42 00					2	0	CH	10			Y
	30-82	ch	00CH00 00					0	0	HR	0	P		Y
4	0-30	mzc1	10YR53 00					2	0	CH	12			Y
	30-35	mzc1	10YR64 00					0	0	CH	50	M		Y
	35-87	ch	00CH00 00					0	0	HR	0	P		Y
5	0-28	mzc1	10YR53 00					0	0	CH	12			Y
	28-80	ch	00CH00 00					0	0	HR	0	P		Y
6	0-35	mzc1	10YR53 00					0	0	CH	12			Y
	35-87	ch	00CH00 00					0	0	HR	0	P		Y

SOIL PIT DESCRIPTION

Site Name : DOVER ROAD DEAL KENT Pit Number : 1P

Grid Reference: TR36454944 Average Annual Rainfall : 750 mm
 Accumulated Temperature : 1445 degree days
 Field Capacity Level : 156 days
 Land Use : Cereals
 Slope and Aspect : 03 degrees NW

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 30	MZCL	10YR53 00	3	13		
30- 82	CH	00CH00 00	0	0		

Wetness Grade : 1 Wetness Class : I
 Gleying : cm
 SPL : cm

Drought Grade : 3A APW : 96 mm MBW : -18 mm
 APP : 93 mm MBP : -16 mm

FINAL ALC GRADE : 3A
 MAIN LIMITATION : Droughtiness