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Maidstone Borough Local Plan
Site 86 Land South of Dickley Lane, Harrietsham, Kent
Agricultural Land Classification
ALC Map and Report
May 1995

AGRICULTURAL LAND CLASSIFICATION, REPORT

MAIDSTONE BOROUGH LOCAL PLAN
SITE 86 LAND SOUTH OF DICKLEY LANE, HARRIETSHAM

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 Maidstone Borough of Kent The work forms part of MAFF s statutory input to the Maidstone Borough Local Plan

1 2 Site 86 comprises 5 2 hectares of land to the east of Harrietsham in Kent An Agricultural Land Classification (ALC) survey was carried out in April 1995 The survey was undertaken at a detailed level of approximately one boring per hectare A total of 5 borings and one soil inspection pit were assessed according to 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 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 agricultural land was under permanent grass The Urban area shown is a dwelling and associated garden

1 5 The distribution of grades and subgrades is shown on the attached ALC map and the areas 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 map supersedes any previous ALC survey information for this site

Table 1 Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site	% of Agricultural Area
2	2 8	54 9	57 1
3a	1 9	37 3	38 8
3b	0 2	3 9	4 1
Urban	0 2	3 9	100% (4 9ha)
Total area of Site	5 1ha	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 agricultural land at this site has been classified as Grade 2 (very good quality) to Subgrade 3b (moderate quality) including a substantial proportion of Subgrade 3a (good quality) Principal limitations include soil droughtiness and slope The

area of Grade 2 land contains deep fine loamy soils over chalk at depth leading to a slight soil droughtiness limitation Where Subgrade 3a is mapped solid chalk underlies fine loamy soils at moderate depths causing profile available water to be moderately restricted Chalk has the effect of restricting plant rooting depth such that there is a reduction in the available water capacity of the soil This leads to slight and moderate risks of drought stress at this site The area mapped as Subgrade 3b is affected by a slope limitation Gradients in the range 7-11° were measured in this area These are sufficient to compromise the safe and efficient use of agricultural machinery restricting this area to Subgrade 3b

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

2 4 The site is believed to be rather frost prone (Met Office 1971) This is due to site location in an area of cold air drainage and from which further air movement is poor The site is not thought to be exposed However climatic and soil factors interact to influence soil wetness and droughtiness limitations to a greater extent

Table 2 Climatic Interpolation

Grid Reference	TQ880528	TQ881529
Altitude (m AOD)	110	115
Accumulated Temperature (day degrees C Jan June)	1380	1374
Average Annual Rainfall (mm)	746	749
Field Capacity Days	156	156
Moisture deficit wheat (mm)	106	105
Moisture deficit potatoes (mm)	97	96
Overall Climatic Grade	1	1

3 Relief

3 1 The site lies between approximately 110 and 115m AOD It lies at the head of a dry valley feature on a north east to south west axis The highest land is to the west and east of the site The majority of the slopes on the site were not significant in terms of land quality although towards the east of the site slope gradient was sufficient to affect land quality

4 Geology and Soils

4 1 The published geological information (BGS 1976) shows the site to be underlain by Cretaceous Lower Chalk

4 2 The most recent published soils information (SSEW 1983) shows the site to be underlain by soils of the Coombe 2 Association The legend accompanying the map describes these as well drained calcareous fine silty soils over chalk or chalk rubble Shallow in places especially on brows and steeper slopes (SSEW 1983) The soils encountered at this site were of this broad type

5 Agricultural Land Classification

5 1 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 are shown on the attached sample point map

Grade 2

5 3 Land of very good quality has been mapped across the centre of the site The principal limitation is soil droughtiness Soils in this area were found to be free draining (Wetness Class I) and to comprise a very slightly stony (2% v/v total flints) calcareous medium silty clay loam topsoil This passes to a very slightly stony and/or chalky (up to 3% v/v total chalk fragments and/or flints) medium silty clay loam upper subsoil This passes to a similarly stony/chalky heavy silty clay loam horizon occasionally occurring to depth (120cm) At other observations the heavy silty clay loam horizon gave way either to a slightly stony (8% v/v flints) clay over solid chalk or passed directly to compact solid chalk This was impenetrable and occurred between 90 and 100cm depth Chalk has the effect of restricting plant rooting depth and subsequently plant available water is reduced At the pit observation 1p on the adjacent Subgrade 3a land roots were observed to penetrate approximately 15cm into the chalk before it became very compact As the auger borings were impenetrable in the Grade 2 land the chalk is believed to be very compact and/or stony immediately below the soil/chalk interface As a result there is little potential available water beneath the subsoil (roots may not for example be able to penetrate even 10cm into the chalk rock) and the land cannot be graded higher than 2 This causes a very slight soil droughtiness limitation to apply in this area which is likely to affect plant growth and yield

Subgrade 3a

5 4 Land of good quality has been mapped across the east and west of the site in two separate units each located on the sloping land The principal limitation is soil droughtiness The well drained (Wetness Class I) profiles typically comprise a slightly stony and /or chalky (up to 10% v/v flints and/or 5% v/v chalk fragments) calcareous medium silty clay loam topsoil This passes to a very slightly stony (5%

v/v total flints) or slightly chalky (10% v/v chalk fragments) medium silty clay loam upper subsoil horizon This directly overlies solid chalk at around 50-55cm Chalk has the effect of restricting plant rooting depth having the effect of reducing plant available water In the pit observation 1p (see Appendix III) roots were observed to penetrate approximately 15cm into the chalk at which point it became very compact Given the local climatic data moisture balances on these profiles fall into the range that are assigned to Subgrade 3a Soil droughtiness has the effect of reducing plant growth and yield in this case to a moderate degree

Subgrade 3b

5 5 Towards the extreme east of the site on the west facing slopes of the valley feature slope gradient was a significant factor in the land classification Gradients in this area were measured in the range 7 11° Slopes of this gradient are sufficient to compromise the safe and efficient operation of farm machinery particularly for cultivation and harvesting insofar as Subgrade 3b is appropriate

SOURCES OF REFERENCE

British Geological Survey (1976) Sheet 288 Maidstone Solid & Drift Edition 1 50 000

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

Meteorological Office (1971) Unpublished Climate data relating to Sheet 173 1 63 360

Meteorological Office (1989) Climatic datasets for Agricultural Land Classification

Soil Survey of England and Wales (1980) Bulletin No 9 Soils of Kent

Soil Survey of England and Wales (1983) Sheet No 6 Soils of South East England 1 250 000 and Accompanying Legend

Soil Survey of England and Wales (1984) Bulletin No 15 Soils and their use in South East England

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 applv

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	**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	

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 MAIDSTONE LP SITE 86 Pit Number 1P

Grid Reference TQ88225184 Average Annual Rainfall 749 mm
Accumulated Temperature 1374 degree days
Field Capacity Level 156 days
Land Use Permanent Grass
Slope and Aspect 3 degrees W

HORIZON	TEXTURE	COLOUR	STONES 2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 27	MZCL	25Y 53 00	3	10	HR					Y
27- 55	HZCL	25Y 54 00	0	5	HR		MDCSAB	FR	M	Y
55- 70	CH	25Y 71 00	0	0					P	Y

Wetness Grade 1 Wetness Class I
Gleying cm
SPL cm

Drought Grade 3A APW 99 mm MBW 6 mm
APP 107mm MBP 11 mm

FINAL ALC GRADE 3A
MAIN LIMITATION Droughtiness

program ALC012 LIST OF BORINGS HEADERS 09/05/95 MAIDSTONE LP SITE 86 page 1

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	TQ88005180	PGR	S	3			1	1	99	6	103	7	3A				DR	3A	IMP CHALK 60
1P	TQ88225184	PGR	W	3			1	1	99	6	107	11	3A				DR	3A	PIT75 ROOTS70
2	TQ88145184	PGR					1	1	156	51	121	25	1					1	
3	TQ88225184	PGR	W	3			1	1	103	2	111	15	3A				DR	3A	IMP CHALK 70
4	TQ88065170	PGR					1	1	129	24	121	25	2				DR	2	IMP CHALK 100
5	TQ88145173	PGR	NW	3			1	1	127	22	121	25	2				DR	2	IMP CHALK 90

program ALC011 COMPLETE LIST OF PROFILES 09/05/95 MAIDSTONE LP SITE 86 page 1

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	0-30	mzcl	25Y 53 00						0	0	CH	5					Y		
	30-50	mzcl	25Y 53 63						0	0	CH	10		M			Y		
	50 65	ch	25Y 71 00						0	0		0		P			Y		IMP CHALK 60
1P	0 27	mzcl	25Y 53 00						3	1	HR	10					Y		
	27 55	hzcl	25Y 54 00						0	0	HR	5	MDCSAB	FR	M		Y		
	55 70	ch	25Y 71 00						0	0		0		P			Y		ROOTS OBS TO 70
2	0 25	mzcl	10YR43 53						1	0	HR	2					Y		
	25 45	mzcl	10YR64 00						0	0	CH	3		M			Y		
	45 120	hzcl	10YR64 00						0	0	CH	10		M			Y		
3	0 30	mzcl	25Y 53 00						0	0	CH	5					Y		
	30-55	hzcl	25Y 54 00						0	0	HR	5		M			Y		
	55-70	ch	25Y 71 00						0	0		0		P			Y		IMP CHALK 70
4	0 23	mzcl	10YR43 42						1	0	HR	2							
	23 45	mzcl	10YR44 00						0	0	HR	3		M					
	45 70	hzcl	10YR54 00						0	0	HR	3		M					
	70 100	c	10YR54 00						0	0	HR	8		M					IMP CHALK 100
5	0 23	mzcl	05Y 42 00						1	0	HR	2					Y		
	23 42	mzcl	10YR64 00						0	0	CH	5		M			Y		
	42 90	hzcl	10YR64 00						0	0	CH	8		M			Y		IMP CHALK 90