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Maidstone Borough Local Plan
Site 55 Land at Cross Keys,
Bearsted
Agricultural Land Classification
ALC Map and Report
August 1994

AGRICULTURAL LAND CLASSIFICATION REPORT

MAIDSTONE BOROUGH LOCAL PLAN
SITE 55 LAND AT CROSS KEYS, BEARSTED

1 Summary

1 1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality for 47 sites within the borough of Maidstone in Kent The work forms part of MAFF's statutory input to the preparation of the Maidstone Borough Local Plan

1 2 Site 55 comprises 4 8 hectares of land bounded to the east by Sutton Street and to the west by Cross Keys in the village of Bearsted An Agricultural Land Classification (ALC) survey was carried out during August 1994 The survey was undertaken at a detailed level of approximately two borings per hectare of agricultural land surveyed A total of 6 borings and two soil inspection pits 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 the Resource Planning Team of the Guildford Statutory Group of ADAS

1 4 At the time of survey the land use on the site was permanent pasture used for grazing by horses In the east of the site land was mapped as non-agricultural because of severe scrub and tree encroachment Land shown as woodland comprises mature deciduous trees

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

Table 1 Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site	% of Agricultural Land
2	2 9	60 4	85 3
3a	0 5	10 4	14 7
Non agricultural	1 0	20 9	100 0 (3 4 ha)
Woodland	0 4	8 3	
Total area of site	4 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 The majority of agricultural land surveyed has been classified as Grade 2, very good quality because of a slight soil droughtiness limitation Topsoils typically comprise medium silty clay loams and medium clay loams These overlie similarly textured upper subsoils and heavier textured typically heavy clay loam and clay lower subsoils Profiles are very slightly to slightly stony throughout and are free draining The interaction of soil textures and profile stone contents with the prevalent local climate in this area may act to slightly restrict plant growth and yield by causing a reduction in available water The slightly lower lying land on the site has been classified as Subgrade 3a, good quality because of a moderate soil wetness limitation Heavy clay loam topsoils overlie clay upper and lower subsoils which pass into heavy clay loam at depth Profiles are moderately well drained as a result of a fluctuating groundwater table Soil wetness may adversely affect crop growth and development and restrict the utilisation of 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 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 The crop adjusted soil moisture deficits at this locality are relatively high in a regional context High soil moisture deficits increase the likelihood of soil droughtiness limitations

2 4 No local climatic factors such as exposure or frost risk are believed to affect the site

Table 2 Climatic Interpolations

Grid Reference	TQ805556	TQ803555
Altitude (m)	40	45
Accumulated Temperature (degree days Jan June)	1461	1455
Average Annual Rainfall (mm)	710	713
Field Capacity (days)	146	146
Moisture Deficit Wheat (mm)	117	116
Moisture Deficit, Potatoes (mm)	111	111
Overall Climatic Grade	1	1

3 Relief

3 1 The agricultural land and woodland on the site occupy relatively flat land which lies at approximately 45m AOD Land adjacent to the stream lies at a slightly lower altitude of approximately 40m AOD The non agricultural land on the site occupies a steeply sloped area, falling from approximately 50m AOD along the western boundary to approximately 40m AOD at the base of the slope

4 Geology and Soil

4 1 British Geological Survey (1976), Sheet 288 shows four different geological deposits at this site Land adjacent to the stream and covered by the lower half of the non agricultural area and the woodland area is shown to be underlain by alluvium In the north of the site a small area is shown as Folkestone Beds The upper half of the non-agricultural area and to the south west of the woodland is mapped as Hythe Beds (sandy limestone and calcareous sands) The remaining predominant geological deposit is shown as Sandgate Beds

4 2 Soil Survey of England and Wales (1983) Sheet 6 shows the entire site to comprise soils of the Malling Association These soils are described as well drained non calcareous fine loamy soils over limestone at variable depths Some deep well drained coarse loamy soils and similar fine loamy over clayey soils Some fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging (SSEW 1983)

4 3 Detailed field examination found two soil types moderately well drained soils which generally occur over the alluvium and well drained slightly stony loamy soils elsewhere

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 The majority of agricultural land surveyed has been classified as Grade 2 very good quality because of a slight soil droughtiness limitation Topsoils typically comprise non calcareous medium clay loams and medium silty clay loams Due to the very dry soil conditions at the time of survey two of the borings within this mapping unit proved impenetrable to an auger below the topsoil Where it was possible to auger below the topsoil profiles were found to comprise medium clay loam and medium silty clay loam upper subsoils Lower subsoils, typically heavy clay loam and heavy silty clay loam, occur from about 45-60 cm depth Again very dry soil conditions at the time of survey resulted in these borings becoming

impenetrable to an auger between 60 and 70 cm depth Consequently a soil inspection pit (Pit 2) was dug to assess soil conditions at depth Topsoils and upper subsoils were found to be very slightly stony (c 3% total flints by volume) passing into a slightly stonier horizon (c 10% total flints by volume) at about 47cm At about 63 cm this profile passed into a lower subsoil with similar stone contents to above (c 2% total flints by volume) which extended to depth Such stone contents are typical of that observed within the auger borings of this mapping unit Due to the interaction between these soil textures and profile stone contents with the relatively dry climate which prevails at this locality this land is restricted by a minor soil droughtiness limitation The slightly restricted soil available water for crops at this site will tend to reduce the level and consistency of crop yields and gives rise to a minor risk of drought stress for those crops which are grown

Subgrade 3a

5 4 Land adjacent to the stream can be classified as no better than Subgrade 3a, good quality This land which generally overlies the alluvium on the slightly lower lying land on the site is restricted by a moderate soil wetness limitation Non calcareous very slightly stony heavy clay loam topsoils overlie clay upper subsoils which pass into heavy clay loam lower subsoils at about 70-80 cm depth These stoneless subsoils are moderately structured and are gleyed as a result of fluctuating groundwater levels Consequently such profiles which are represented by Pit 1 are assigned to Wetness Class II The interaction between this slight impedance to drainage and the heavy topsoil textures with the relatively dry prevailing climate at this site means this land is classified as Subgrade 3a on the basis of soil workability and wetness limitations Such soil workability characteristics may act to moderately restrict the opportunities for grazing by livestock and timing of cultivations whilst the soil wetness may adversely affect crop growth and yield

SOURCES OF REFERENCE

British Geological Survey (1976) Sheet No 288 Maidstone 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	**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 55 2ND Pit Number 1P

Grid Reference TQ80505570 Average Annual Rainfall 710 mm
Accumulated Temperature 1461 degree days
Field Capacity Level 146 days
Land Use Permanent Grass
Slope and Aspect 01 degrees SW

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0 18	HCL	10YR42 00	4	10	HR					
18- 53	C	10YR42 53	0	0		M	MDCSAB	VM	M	
53- 70	C	10YR53 52	0	0		C	MDCSAB	FR	M	
70-120	HCL	10YR42 00	0	0		C			M	

Wetness Grade 3A Wetness Class II
Gleying 018 cm
SPL No SPL

Drought Grade 2 APW 147mm MBW 30 mm
APP 113mm MBP 2 mm

FINAL ALC GRADE 3A
MAIN LIMITATION Wetness

SOIL PIT DESCRIPTION

Site Name MAIDSTONE LP SITE 55 2ND Pit Number 2P

Grid Reference TQ80505550

Average Annual Rainfall	710 mm
Accumulated Temperature	1461 degree days
Field Capacity Level	146 days
Land Use	Permanent Grass
Slope and Aspect	01 degrees E

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 25	MCL	10YR32 00	0	3	HR					
25- 47	MZCL	10YR33 00	0	3	HR		MDCSAB	FR	M	
47- 63	HCL	10YR44 00	0	10	HR		MDCSAB	FR	M	
63-120	HCL	10YR53 00	0	2	HR	C	STCSAB	FM	M	

Wetness Grade 1

Wetness Class	I
Gleying	063 cm
SPL	No SPL

Drought Grade 2

APW	152mm	MBW	35 mm
APP	114mm	MBP	3 mm

FINAL ALC GRADE 2

MAIN LIMITATION Droughtiness

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	TQ80505570	RGR	SW	01	025		2	3A	147	30	115	4	2				WE	3A	
1P	TQ80505570	PGR	SW	01	018		2	3A	147	30	113	2	2				WE	3A	Pit 70
2	TQ80425560	RGR	SE	04			1	1	51	-66	51	-60	4				DR	2	Imp 30 Re 2P
2P	TQ80505550	PGR	E	01	063		1	1	152	35	114	3	2				DR	2	Pit dug to 80
3	TQ80505560	PGR			030		2	2	107	-10	123	12	3A				WD	2	
5	TQ80405550	PGR					1	1	109	-8	122	11	3A				DR	2	Imp 70 Re 2P
6	TQ80505550	PGR					1	1	96	-21	103	-8	3B				DR	2	Imp 60 Re 2P
7	TQ80405542	PGR					1	1	57	-60	57	-54	4				DR	2	Imp 30 Re 2P

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	hcl	10YR42 00						0	0	HR	5						
	25-45	c	10YR41 42	10YR46 00	C			Y	0	0		0		M				
	45-80	c	10YR61 62	75YR58 00	C			Y	0	0		0		M				
	80-120	hcl	10YR41 52	75YR58 00	C			Y	0	0		0		M				
1P	0-18	hcl	10YR42 00						4	0	HR	10						
	18-53	c	10YR42 53	10YR58 00	M			Y	0	0		0	MDCSAB	VM M				
	53-70	c	10YR53 52	10YR58 00	C			Y	0	0		0	MDCSAB	FR M	Y			
	70-120	hcl	10YR42 00	10YR56 00	C			Y	0	0		0		M	Y			
2	0-30	mcl	10YR43 00						0	0	HR	5						Imp 30 v dry
2P	0-25	mcl	10YR32 00						0	0	HR	3						
	25-47	mzcl	10YR33 00						0	0	HR	3	MDCSAB	FR M				
	47-63	hcl	10YR44 00						0	0	HR	10	MDCSAB	FR M				
	63-120	hcl	10YR53 00	75YR43 62	C			Y	0	0	HR	2	STCSAB	FM M	Y			
3	0-30	mzcl	10YR42 00						0	0		0						
	30-45	mzcl	10YR52 00	10YR58 00	C			Y	0	0		0		M				
	45-70	c	10YR63 00	10YR78 61	C			Y	0	0		0		M				
5	0 26	mzcl	10YR42 00						0	0	CH	2						
	26 50	mzcl	10YR43 00						0	0		0		M				
	50-70	hzcl	10YR53 00						0	0	HR	5		M				Imp 70 v dry
6	0 25	mzcl	10YR42 00						0	0	CH	3						
	25-40	mszl	10YR43 00						0	0	HR	10		M				
	40 60	mzcl	10YR43 00						0	0	HR	2		M				Imp 60 v dry
7	0-30	mzcl	10YR43 00						0	0		0						Imp 30 v dry