

**A1**  
**Maidstone Borough Local Plan**  
**Site 58 Land North of West Street,**  
**Harrietsham**  
**Agricultural Land Classification**  
**ALC Map and Report**  
**August 1994**

# AGRICULTURAL LAND CLASSIFICATION REPORT

## MAIDSTONE BOROUGH LOCAL PLAN

### SITE 58 LAND NORTH OF WEST STREET, 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 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 58 comprises approximately 7 hectares of land to the north of West Street and south of the railway line in the village of Harrietsham. An Agricultural Land Classification (ALC) survey was carried out during August 1994. 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 survey the agricultural land on the site was unmanaged grassland. A small area of woodland and derelict farm buildings have been mapped on the site.
- 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	5.3	70.7	74.6
3b	1.8	24.0	25.4
Woodland	0.3	4.0	<u>100%</u> (7.1 ha)
Farm buildings	0.1	1.3	
Total area of site	<u>7.5</u>	<u>100%</u>	

- 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 the agricultural land on the site has been classified as Grade 2 very good quality land with soil droughtiness as the main limitation. Soil profiles typically comprise sandy loams or clay loams which can become heavier with depth. The combination of soil textures, structures, stone contents and the local climatic regime means that there is a slight restriction on the amount of profile available water for plant growth. Therefore this slight droughtiness limitation means that a classification of Grade 2 is appropriate. The remainder of the agricultural land has been classified as Subgrade 3b moderate quality land with soil wetness and slope as the main limitations. In the north western corner of the site slopes of 8.5° were measured which is sufficient to place this land into Subgrade 3b due to the adverse effects that steep slopes have upon agricultural use. In the eastern corner of the site soil profiles typically comprise a medium silty clay loam topsoil over a slowly permeable clay subsoil at a relatively shallow depth which impedes soil drainage. Poorly drained soils inhibit plant and root development and may be more prone to structural damage as a result of agricultural operations.

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

## **Table 2 Climatic Interpolation**

Grid Reference	TQ 863528
Altitude (m)	85
Accumulated Temperature (degree days Jan June)	1409
Average Annual Rainfall (mm)	729
Field Capacity (days)	153
Moisture Deficit Wheat (mm)	109
Moisture Deficit Potatoes (mm)	101
Overall Climatic Grade	1

### **3 Relief**

- 3 1 The majority of the site is gently sloping lying at an altitude of approximately 85 90m AOD In the north-west of the site slope gradient causes a limitation to agricultural use

### **4 Geology and Soil**

- 4 1 The relevant geological sheet (BGS 1976) shows the entire site to be underlain by Folkestone Beds comprising sands of the lower Greensand
- 4 2 The published Soil Survey map (SSEW 1983) shows the soils on the site to comprise those of the Fyfield 2 association These soils are described as well drained coarse loamy and sandy soils over sands and sandstones (SSEW 1983)
- 4 3 Detailed field examination found the soils on the site to be variable in composition Relatively stoneless coarse textured soils were found towards the west of the site Heavier textured loamy soils with stony subsoils in the west of the site with a small area of poorly drained soils with clay subsoils in the north west

### **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 the agricultural land on the site has been classified as Grade 2 very good quality with slight soil droughtiness as the main limitation. The nature of the soils within this mapping unit vary across the site. Towards the west and north of the site profiles tend to be coarse textured particularly in the topsoil becoming heavier and more loamy with depth. Medium sandy silt loam topsoils tend to overlie medium clay loam sandy clay loam medium sandy loam or loamy sand subsoils. Profiles tend to be very slightly stony (2-5% total flints) throughout the presence of flints causing the subsoils to be occasionally impenetrable to the auger at varying depths. Towards the east of the site profiles tend to be more loamy in texture comprising medium clay loam topsoils over subsoils which become heavier with depth proving impenetrable to the auger at depths of between 25-70cm. Consequently a soil inspection pit (Pit no 1) was dug to assess the nature of the subsoils. The soil profiles was found to comprise a very slightly stony (5% total flints) medium clay loam topsoil over a similarly textured upper subsoil containing approximately 17% total flints and extending to about 58 cm. The lower subsoils comprise a heavy clay loam with varying stone contents being slightly stony (10% total flints) to a depth of 80cm and moderately stony (25% total flints) below this. Furthermore subsoils were found to have a moderate substructural condition.
- 5 4 All of the soils in this mapping unit show no signs of wetness and are therefore assigned to Wetness Class I. Yet a combination of soil textures structures and stone contents evidenced in both the pit and a number of the borings along with the local climatic regime means that there is a slight restriction on profile available water for plant growth. This will have an effect upon the level and consistency of crop yields such that a classification of Grade 2 is appropriate due to this minor droughtiness limitation.

## **Subgrade 3b**

- 5 5 Moderate quality land has been mapped towards the south east and north-west of the site with soil wetness and gradient of slope as the respective limitations. In the east profiles typically comprise a medium silty clay loam topsoil which overlies a clay subsoil at depths of between 27-35 cm. Both the topsoils and subsoils show signs of a wetness limitation in the form of gleying and the clay subsoil is slowly permeable causing a restriction to drainage and rooting. Such drainage characteristics equate these soils to Wetness Class IV with a resultant classification of Subgrade 3b. Soils that suffer from wetness problems restrict crop establishment and growth and may be more susceptible to structural damage in the form of trafficking by agricultural machinery or poaching by grazing livestock.

- 5 6 In the north-west the slope gradient measured with an optical reading clinometer was found to be  $8.5^{\circ}$  which is sufficient to cause a significant limitation on agricultural operations. Gradient has an effect upon mechanised farm operations since most conventional agricultural machinery performs best on level ground. Therefore steep slopes can restrict the safe and efficient use of machinery.

ADAS Ref 2007/164/94  
MAFF Ref EL 20/328

Resource Planning Team  
Guildford Statutory Group  
ADAS Reading

## **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 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* 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 <sup>1</sup>
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years <sup>2</sup>
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.

<sup>1</sup>The number of days specified is not necessarily a continuous period

<sup>2</sup>In most years is defined as more than 10 out of 20 years

# APPENDIX III

## SOIL PIT AND SOIL BORING DESCRIPTIONS

### Contents

Soil Abbreviations - Explanatory Note

Soil Pit Descriptions

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 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:
 

<b>ARA</b> Arable	<b>WHT</b> Wheat	<b>BAR</b> Barley
<b>CER</b> Cereals	<b>OAT</b> Oats	<b>MZE</b> Maize
<b>OSR</b> Oilseed rape	<b>BN</b> Field Beans	<b>BRA</b> Brassicae
<b>POI</b> Potatoes	<b>SB</b> Sugar Beet	<b>ICD</b> Odder Crops
<b>LIN</b> Linseed	<b>STF</b> Soft and Top Fruit	<b>FLW</b> Fallow
<b>PGR</b> Permanent Pasture	<b>LY</b> Ley Grass	<b>RGR</b> Rough Grazing
<b>SCR</b> Scrub	<b>CFW</b> Coniferous Woodland	<b>DCW</b> Deciduous Wood
<b>HTH</b> Heathland	<b>BOG</b> Bog or Marsh	<b>FLW</b> Fallow
<b>PLO</b> Ploughed	<b>SAS</b> Set aside	<b>OTH</b> Other
<b>HRT</b> Horticultural Crops		
- 3 **GRDNT** Gradient as estimated or measured by a hand held optical clinometer
- 4 **GLEYSPL** Depth in centimetres (cm) to gleying and/or slowly permeable layers
- 5 **AP (WHEAT/POTS)** Crop adjusted available water capacity
- 6 **MB (WHEAT/POIS)** Moisture Balance (Crop adjusted AP - crop adjusted MD)
- 7 **DR1** Best grade according to soil droughtiness
- 8 If any of the following factors are considered significant 'Y' will be entered in the relevant column:
 

<b>MREL</b> Microrelief limitation	<b>FLOOD</b> Flood risk	<b>EROSN</b> Soil erosion risk
<b>EXP</b> Exposure limitation	<b>FROST</b> Frost prone	<b>DIST</b> Disturbed land
<b>CHEM</b> Chemical limitation		
- 9 **LIMIT** The main limitation to land quality. The following abbreviations are used:
 

<b>OC</b> Overall Climate	<b>AE</b> Aspect	<b>EX</b> Exposure
<b>FR</b> Frost Risk	<b>GR</b> Gradient	<b>MR</b> Microrelief
<b>IL</b> Flood Risk	<b>TX</b> Topsoil Texture	<b>DP</b> Soil Depth
<b>CH</b> Chemical	<b>WE</b> Wetness	<b>WK</b> Workability
<b>DR</b> Drought	<b>ER</b> Erosion Risk	<b>WD</b> Soil Wetness/Droughtiness
<b>ST</b> Topsoil Stoniness		

## Soil Pits and Auger Borings

1 **TEXTURE** soil texture classes are denoted by the following abbreviations

<b>S</b>	Sand	<b>LS</b>	Loamy Sand	<b>SL</b>	Sandy Loam
<b>SZL</b>	Sandy Silt Loam	<b>CL</b>	Clay Loam	<b>ZCL</b>	Silty Clay Loam
<b>ZL</b>	Silt Loam	<b>SCL</b>	Sandy Clay Loam	<b>C</b>	Clay
<b>SC</b>	Sandy Clay	<b>ZC</b>	Silty Clay	<b>OL</b>	Organic Loam
<b>P</b>	Peat	<b>SP</b>	Sandy Peat	<b>LP</b>	Loamy Peat
<b>PL</b>	Peaty Loam	<b>PS</b>	Peaty Sand	<b>MZ</b>	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

<b>F</b>	Fine (more than 66% of the sand less than 0.2mm)
<b>M</b>	Medium (less than 66% fine sand and less than 33% coarse sand)
<b>C</b>	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 **GLEYS** 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

<b>HR</b>	all hard rocks and stones	<b>SLST</b>	soft oolitic or dolimitic limestone
<b>CH</b>	chalk	<b>FSST</b>	soft fine grained sandstone
<b>ZR</b>	soft argillaceous or silty rocks	<b>GH</b>	gravel with non porous (hard) stones
<b>MSSI</b>	soft medium grained sandstone	<b>GS</b>	gravel with porous (soft) stones
<b>SI</b>	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 appropriate 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 58 Pit Number 1P

Grid Reference TQ86405280 Average Annual Rainfall 729 mm  
 Accumulated Temperature 1409 degree days  
 Field Capacity Level 153 days  
 Land Use Rough Grazing  
 Slope and Aspect 01 degrees S

HORIZON	TEXTURE	COLOUR	STONES	2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0 32	MCL	10YR42 00	0		5	HR					
32 58	MCL	10YR53 00	0		17	HR		MDCSAB	FM	M	
58- 80	HCL	10YR54 00	0		10	HR		WKCSAB	FM	M	
80 120	HCL	10YR54 00	0		25	HR				M	

Wetness Grade 1 Wetness Class I  
 Gleying cm  
 SPL No SPL

Drought Grade 2 APW 136mm MBW 27 mm  
 APP 107mm MBP 6 mm

FINAL ALC GRADE 2  
 MAIN LIMITATION Droughtiness

SAMPLE	DEPTH	TEXTURE	COLOUR	---MOTTLES---			PED COL	--- STONES---			STRUCT/ CONSIST	SUBS			SPL	CALC
				COL	ABUN	CONT		GLE	>2	>6		LITH	TOT	STR		
1P	0-32	mc1	10YR42 00					0	0	HR	5					
	32-58	mc1	10YR53 00					0	0	HR	17	MDCSAB	FM	M		
	58-80	hc1	10YR54 00					0	0	HR	10	WKCSAB	FM	M		
	80-120	hc1	10YR54 00					0	0	HR	25			M		
2	0-25	ms1	10YR42 00					0	0		0					
	25-90	ms1	10YR54 00					0	0		0			M		
	90-120	lms	10YR54 56					0	0		0			M		
3	0-20	msz1	10YR42 00					0	0	HR	2					
	20-55	mc1	10YR54 00					0	0	HR	5			M		
	55-90	ms1	10YR54 56					0	0		0			M		
	90-120	lms	10YR54 00					0	0		0			M		
4	0-22	mzc1	10YR42 00	10YR58 00	C			Y	0	0	0					
	22-35	hzc1	10YR53 00	10YR58 00	C	00M00	00	Y	0	0	0			M		
	35-70	c	10YR52 54	10YR58 62	M			Y	0	0	0			P	Y	IMPEN FLINTS
5	0-27	mzc1	10YR42 00	10YR58 00	C			Y	0	0	CH	2				
	27-70	c	05Y 62 00	10YR58 00	M			Y	0	0	CH	2		P	Y	IMPEN FLINTS
6	0-25	msz1	10YR42 00					0	0	HR	5					
	25-40	mc1	10YR53 00					0	0	HR	5			M		
	40-70	c	10YR54 00					0	0	HR	5			M		IMPEN FLINTS
7	0-28	msz1	10YR42 00					0	0	HR	5					
	28-35	sc1	10YR53 00					0	0	HR	5			M		IMPEN FLINTS
8	0-30	mc1	10YR42 00					0	0	HR	2					
	30-50	mc1	10YR53 00					0	0	HR	5			M		IMPEN FLINTS
9	0-25	mc1	10YR42 00					0	0	HR	5					IMPEN FLINTS



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SAMPLE NO	GRID REF	USE	ASPECT	GRDNT	--WETNESS--		WHEAT-		-POTS		M REL		EROSN	FROST	CHEM	ALC	COMMENTS
					GLEY	SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	
1P	TQ86405280	RGR	S	01		1	1	136	27	107	6	2				DR 2	PIT DUG 90
2	TQ86405300	PGR				1	1	138	29	110	9	2				DR 2	
3	TQ86405290	PGR				1	1	141	32	113	12	1					1
4	TQ86505286	PGR			0	035	4	3B		0	0	3A				WE 3B	
5	TQ86605290	PGR			0	027	4	3B		0	0	3A				WE 3B	
6	TQ86205280	RGR	SE	02		1	1	99	-10	114	13	3A				DR 2	I70 SEE1P
7	TQ86305280	RGR	E	01		1	1	61	-48	61	-40	3B				DR 2	I35 SEE1P
8	TQ86405280	RGR	S	01		1	1	83	-26	83	-18	3B				DR 2	I50 SEE1P
9	TQ86505280	RGR	W	01		1	1	43	66	43	-58	4				DR 2	I25 SEE1P