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Maidstone Borough Local Plan
Land At Forstal Road, Maidstone

Agricultural Land Classification
June 1996

Resource Planning Team
Guildford Statutory Group
ADAS Reading

ADAS Reference 2007/058/96
MAFF Reference EL 20/328
LUPU Commission 2340

AGRICULTURAL LAND CLASSIFICATION REPORT

MAIDSTONE BOROUGH LOCAL PLAN LAND AT FORSTAL ROAD, MAIDSTONE

Introduction

1 This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 8.8 ha of land at Forstal Road Maidstone. The survey was carried out in May 1996.

2 The survey was commissioned by the Ministry of Agriculture Fisheries and Food (MAFF) from its Land Use Planning Unit in Reading in connection with the Maidstone Borough Council Local Plan. This survey supersedes previous ALC surveys on this land.

3 The work was conducted under sub contracting arrangements by NA Duncan and Associates and was supervised by members of the Resource Planning Team in the Guildford Statutory Group of ADAS. The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF 1988). A description of the ALC grades and subgrades is given in Appendix I.

4 The site is the area of a former Borrow Pit for the construction of the M20 motorway and was restored to its present state during the summer of 1995. At the time of survey the land was under rough grassland. Two areas of Other Land have also been mapped. At the eastern end of the site is a small area of scrub woodland. In the north western corner of the site is a small area of hard standing with a soil bund extending alongside Forstal Road.

Summary

5 The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10,000. It is accurate at this scale but any enlargement would be misleading.

6 The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1.

Table 1 Area of grades and other land

Grade/Other land	Area (hectares)	% Total site area	% Surveyed area
3b	7.6	86.4	100.0
Other land	1.2	13.6	-
Total survey area	7.6	-	100.0
Total site area	8.8	100.0	

7 The fieldwork was conducted at an average density of one auger boring per hectare. A total of 10 borings were described.

8 The site has mainly been classified as Interim Subgrade 3b moderate quality agricultural land. An interim grading has been assigned to this land as it has only been recently restored following use as a Borrow Pit for the construction of the M20 motorway. The soils on the site mainly comprise sandy clay loam topsoils over similar or slightly heavier textured subsoils. Several of the profiles examined exhibited moderately severe compaction with some areas containing considerable amounts of flint, concrete and tarmac fragments. Moisture balance calculations indicate that most of the soils would be moderately to severely affected by drought and hence limited to Subgrade 3a or 3b. Several profiles showed contamination of the topsoil with subsoil material but in two profiles topsoil was totally lacking and consequently these profiles should not be graded higher than Grade 4. It is however not possible at this scale of mapping to delineate these areas separately and therefore due to the range of quality occurring on the site it is considered that the overall grading of the land should be assessed as Subgrade 3b. It should however be stressed that this grading may change with time depending whether any further restorative measures are taken on the area.

Climate

9 Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.

10 The key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5km grid datasets using the standard interpolation procedures (Met Office 1989).

Table 2 Climatic and altitude data

Factor	Units	Values	Values	Values
Grid reference	N/A	TQ 744 584	TQ 746 585	TQ 748 585
Altitude	m AOD	5	15	25
Accumulated Temperature	day°C	1500	1488	1477
Average Annual Rainfall	mm	651	653	655
Field Capacity Days	days	134	135	135
Moisture Deficit Wheat	mm	121	120	118
Moisture Deficit Potatoes	mm	118	116	114

11 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.

12 The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR) as a measure of overall wetness and accumulated temperature (ATO January to June) as a measure of the relative warmth of a locality.

13 The combination of rainfall and temperature at this site mean that the area is relatively dry and warm. The soil moisture deficits at this site are relatively high in a regional context. High soil moisture deficits increase the likelihood of soil droughtiness limitations. The site is not considered to be exposed or subject to any particular frost risk and as such no climatic limitation exists on this site.

Site

14 The site lies on the northern side of the M20 motorway between the motorway and Forstal Road. The land slopes from a high point of approximately 25 m AOD on the northern boundary of the site south of Cobtree Manor down to approximately 5 m AOD in the south west corner adjacent to the River Medway. Gradients are moderately steep over the eastern part of the site where slopes of 5-8° occur levelling off at the western end. Gradient was only found to be limiting in terms of ALC grading at one observation point (auger bore 3). With the exception of this localised area there are no other site limitations that will affect the grading of the land.

Geology and soils

15 The published geological information (BGS 1976) shows the western end of the site to be underlain by pleistocene and recent first river terrace gravels. The higher land to the east is mapped as Lower Greensand Folkestone Beds.

16 The reconnaissance soil survey map (SSEW 1983) for the area shows the site to comprise soils of the Fyfield 2 association which are described as well drained coarse loamy and sandy soils over sands and sandstones (SSEW 1983). However the disturbance that has taken place in this area in recent years means that the existing soils may be somewhat different.

Agricultural Land Classification

17 The details of the classification of the site are shown on the attached ALC map and the area statistics of each grade are given in Table 1 page 1.

18 The location of the auger borings and pits is shown on the attached sample location map and the details of the soils data are presented in Appendix III.

Subgrade 3b

19 The site has mainly been classified as Interim Subgrade 3b moderate quality agricultural land. An interim grading has been assigned to this land as it has only been recently restored following use as a Borrow Pit for the construction of the M20 motorway. The soils on the site mainly comprise sandy clay loam topsoils over similar or slightly heavier textured subsoils. Several of the profiles examined exhibited moderately severe compaction, with some areas containing considerable amounts of flint concrete and tarmac fragments. Moisture balance calculations indicate that most of the soils would be moderately to severely affected by drought and hence limited to Subgrade 3a or 3b. Several profiles showed contamination of the topsoil with subsoil material but in two profiles topsoil was totally lacking and

consequently these profiles should not be graded higher than Grade 4. It is however not possible at this scale of mapping to delineate these areas separately and therefore due to the range of quality occurring on the site it is considered that the overall grading of the land should be assessed as Subgrade 3b. It should however be stressed that this grading may change with time depending whether any further restorative measures are taken on the area.

20 A small area in the north of the site is undisturbed. However this land occupies slopes of 7°-11°. Consequently this land can be classified as no higher than Subgrade 3b due to restrictions on the safe and efficient use of agricultural machinery.

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for the Resource Planning Team
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ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1976) *Sheet No 288 Maidstone 1 50 000*
BGS London

Ministry of Agriculture Fisheries and Food (1988) *Agricultural Land Classification of England and Wales Revised guidelines and criteria for grading the quality of agricultural land*
MAFF London

Met Office (1989) *Climatological Data for Agricultural Land Classification*
Met Office Bracknell

Soil Survey of England and Wales (1983) *Sheet 6 Soils of South East England 1 250 000 and accompanying legend*
SSEW Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in South East England*
SSEW Harpenden

APPENDIX I

DESCRIPTIONS 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 (e.g. 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.

APPENDIX II

SOIL WETNESS CLASSIFICATION

Definitions of Soil Wetness Classes

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.

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

Assessment of Wetness Class

Soils have been allocated to wetness classes by the interpretation of soil profile characteristics and climatic factors using the methodology described in *Agricultural Land Classification of England and Wales Revised guidelines and criteria for grading the quality of agricultural land* (MAFF 1988)

¹ The number of days is not necessarily a continuous period

² In most years is defined as more than 10 out of 20 years

APPENDIX III

SOIL DATA

Contents

Sample location map

Soil abbreviations - Explanatory Note

Soil Pit Descriptions

Soil boring descriptions (boring and horizon levels)

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:

ARA	Arable	WHT	Wheat	BAR	Barley
CER	Cereals	OAT	Oats	MZE	Maize
OSR	Oilseed rape	BEN	Field Beans	BRA	Brassicaceae
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 **GLEYS/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 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

SAMPLE NO	GRID REF	ASPECT USE	--WETNESS--		-WHEAT-		-POTS-		M REL		EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
			GRDNT	GLEYSPL	CLASS	GRADE	AP	MB	AP	MB					
1	TQ74405860	RGR		030 030	3	3A	140	19 101	-17	3A		Y	WD	3A	Nr distbd area
2	TQ74505860	RGR W	04	0 035	3	3A	075	-46 075	-43	3B		Y	TX	4	No topsoil
3	TQ74605860	RGR W	09		1	1	150	29 112	-6	2			GR	3B	Undisturbed
4	TQ74405850	RGR W	01	0 028	2	2	084	-37 093	-25	3B		Y	DR	3B	Compacted
4A	TQ74385852	RGR		0 0	4	3B	000	0 000	0		Y	Y	WE	4	No topsoil
5	TQ74505850	RGR W	03	027 027	4	3B	072	-49 072	-46	3B		Y	WD	3B	Compacted
6	TQ74605850	RGR SW	05	0 030	4	3B	081	-40 088	-30	3B		Y	WD	3B	Compacted
7	TQ74705850	RGR S	05		1	1	052	-69 052	-66	4		Y	DR	4	Compacted
9	TQ74705857	RGR S	06		1	1	076	-45 081	-37	3B			DR	3B	Compacted
10	TQ74355843	RGR W	01	0 030	3	3B	089	-32 098	-20	3B		Y	WD	3B	Compacted

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED COL	----STONES----				STRUCT/ CONSIST	SUBS			SPL	CALC
				COL	ABUN	CONT		GLE	>2	>6	LITH		TOT	STR	POR		
1	0-30	mc1	10YR43 00					0	0	HR	5						Y
	30-65	mc1	10YR44 55 25Y 52 00 C					Y	0	0	HR	2	P			Y	Y
	65-120	hc1	10YR65 64 10YR66 00 C					S	0	0		0	M			Y	Undisturbed
2	0-35	mzc1	10YR55 00					0	0	HR	1		M				
	35-50	hc1	05Y 52 42					0	0	HR	12		P			Y	
3	0-25	ms1	10YR43 00					0	0	HR	1						
	25-45	sc1	10YR44 00					0	0		0		M				
	45-120	mc1	75YR55 00					0	0		0		M				
4	0-28	sc1	10YR43 33					4	0	HR	8						Y
	28-70	sc1	25Y 63 52					0	0	HR	12		P			Y	Y
4A	0-30	hc1	25Y 43 42 75YR56 00 C					Y	0	0	HR	3		P		Y	Y
	30-35	hc1	25Y 42 00					Y	0	0	HR	8		P		Y	
5	0-27	mc1	10YR52 56						3	0	HR	5					Y
	27-50	hc1	25Y 53 00 10YR58 42 C					Y	0	0	HR	7		P		Y	Y
6	0-30	sc1	10YR43 56 05Y 42 00 C					Y	4	4	HR	10					
	30-65	sc1	05Y 52 53					Y	0	0	HR	10		P		Y	
7	0-25	sc1	10YR43 00					0	0	HR	17						
	25-40	sc1	10YR54 00					0	0	HR	18		P			Y	
9	0-27	sc1	10YR43 55					6	2	HR	10						
	27 60	sc1	10YR54 44					0	0	HR	10		P			Y	
10	0-30	mc1	75YR44 53					0	0	HR	5						Y
	30-70	sc1	25Y 53 62					0	0	HR	12		P			Y	Y