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Maidstone Borough Local Plan
Site 96 Land at Otham, Kent

Agricultural Land Classification
ALC Map and Report
May 1996

Resource Planning Team
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ADAS Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

MAIDSTONE BOROUGH LOCAL PLAN
SITE 96 LAND AT OTHAM, KENT

Introduction

1 This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 5 1 hectares of land to the rear of the Orchard Spot Public house near to the village of Otham in Kent The survey was carried out during February 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 District Local Plan The results of this survey supersede any previous ALC information for this land

3 The work was conducted 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 At the time of survey the agricultural land at the site was rough grassland and an overgrown orchard The majority of the site is shown as Other Land comprising mostly impenetrable scrub and woodland which has not been used for any agricultural purpose for many years Currently the whole site is being used by the local residents for recreational purposes ie at present there is believed to be no current agricultural management on the site

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 below

Table 1 Area of grades and other land

Grade/Other Land	Area (hectares)	% Total Site Area	% Surveyed Area
3a	0 3	5 9	14 3
4	1 8	35 3	85 7
Other Land	3 0	58 8	
Total Surveyed Area	2 1		100
Total Site Area	5 1	100	

7 The fieldwork was conducted at an average density of approximately 1 boring per hectare of agricultural land A total of 2 borings and one soil pit were described

8 The agricultural land at this site has been classified as Grade 3a (good quality) and Grade 4 (poor quality) on the basis of soil wetness and slope limitations

9 The area shown as Subgrade 3a is towards the centre of the site comprises an overgrown orchard surrounded by impenetrable scrub and woodland In this area non-calcareous medium loamy topsoils and gleyed medium loamy upper subsoils overlie gleyed and slowly permeable heavy loams and clays at moderate depths in the profile The slowly permeable horizons cause drainage to be impeded such that potential land utilisation is restricted

10 The majority of the agricultural land at the site is mapped as Grade 4 The area towards the north east boundary of the site is limited by slope Gradients in the range 14-17° were measured This causes a restriction in potential land utilisation as most farm machinery cannot be efficiently or safely used in this area Towards the west of the site the land is flatter but it has been disturbed at some point in the past perhaps when the houses bordering the site to the west were built or alternatively it may have been subject to quarrying activity known to have occurred in the local area Soils in this area comprise non-calcareous slightly stony medium loam topsoils over slightly stony gleyed and slowly permeable clays containing glass fragments foam rubber and brick fragments The drainage impedance caused by the shallow slowly permeable layer in combination with the disturbed nature of these soils and the lack of any obvious aftercare beyond applying a topsoil cause this area to be mapped as Grade 4 due to its comparatively restricted agricultural potential

Climate

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

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

Table 2 Climatic and altitude data

Factor	Units	Values	
Grid reference	N/A	TQ 795 542	TQ 795 540
Altitude	m, AOD	40	65
Accumulated Temperature	day°C	1461	1432
Average Annual Rainfall	mm	707	720
Field Capacity Days	days	145	147
Moisture Deficit, Wheat	mm	117	114
Moisture Deficit Potatoes	mm	112	107

13 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

14 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

15 The combination of rainfall and temperature at this site mean that there is no overall climatic limitation Other local climatic factors such as exposure and frost risk are also believed not to affect the site The site is climatically Grade 1

Site

16 The site lies at an altitude between approximately 40 and 70m AOD and contains significant slopes The lowest land is along the north eastern boundary rising steeply to a plateau towards the south of the site The overall gradient on the slopes was measured at between 14 and 17° This is sufficient to restrict this area to Grade 4 as the range of farm machinery that can work efficiently and safely on these gradients is limited In addition the slope was affected by soil slumping and minor landslips such that there were some much steeper gradients over short areas of the overall slope The area to the south of the site continues to rise slightly (3-4°) to the southern border of the site a slope of this gradient is insufficient to affect the land quality

Geology and soils

17 The published geological information for the site (BGS 1974) shows the north of the site to be underlain by Atherfield Clay with Weald Clay along the northern boundary on the lowest lying land The remainder of the site to the south is shown as being underlain by Hythe Beds

18 The most detailed published soils information for the site (SSEW 1983 and 1984) shows the site to comprise soils of the Malling association These 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 Occasional shallower calcareous soils over limestone Landslips and associated irregular terrain locally (SSEW 1983) Soils on the undisturbed flatter area of the site under agricultural use comprise a fine loamy topsoil and upper subsoil over slowly permeable subsoils The disturbed area of the site comprised shallow slowly permeable soils

Agricultural Land Classification

19 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

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

Subgrade 3a

21 Land of good quality has been mapped towards the south of the site in a single mapping unit The principal limitation to land quality is soil wetness

22 Soils in this area commonly comprise a very slightly stony (3% v/v total limestone fragments) medium clay loam topsoil which was non-calcareous overall passing to a similarly stony gleyed medium clay loam upper subsoil These overlie a slightly stony (10% v/v limestone fragments) gleyed and slowly permeable heavy clay loam, which passes to a similarly stony gleyed and slowly permeable clay lower subsoil The pit observation, 1p is representative of this soil type The slowly permeable horizons cause water flow to be restricted in the soil profile thus causing drainage to be impeded to the extent that Wetness Class III has been applied given the local climate Soil wetness affects plant growth and yield as well as restricting land utilisation in terms of the number of days when machinery cultivations and grazing by livestock can occur without causing structural damage to the soil

Grade 4

23 Land of poor quality has been mapped to the north and west of the site in a single unit Principal limitations to land quality include gradient towards the north and to the west of the site land disturbance

24 Towards the north east of the site gradients in the range 14 17° were measured at right angles across a slope which was variable due to previous landslips and soil slumping The range of farm machinery that can be operated efficiently and safely on these severe slopes is very restricted Therefore Grade 4 is appropriate for this land

25 The agricultural land to the west of the site shown as Grade 4 has been disturbed at some point in the past This was initially evidenced by the uneven nature of the ground surface in this area This possibly occurred when the houses to the west of the site were built or previous quarry workings were infilled The soils in this area commonly comprise a very slightly stony (3% v/v total stone fragments) non-calcareous medium clay loam topsoil This appears to have been applied directly over the infill and overlies a slightly stony (10% v/v various hard items) gleyed and slowly permeable clay The clay contained flints brick and glass fragments The shallow depth of the slowly permeable layer causes a severe drainage impedance which in the local climate leads to Grade 4 being appropriate as the area has been disturbed

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SOURCES OF REFERENCE

British Geological Survey (1971) *Sheet 288 Maidstone Solid and Drift Edition 1 50 000 Scale* 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) *Soils of South East England. 1 250 000 Scale* SSEW Harpenden

Soil Survey of England and Wales (1984) *Soils of South East England. Bulletin No 15* 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

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 sandston	**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

SOIL PIT DESCRIPTION

Site Name MAIDSTONE BLP SITE 96 Pit Number 1P

Grid Reference TQ79505407

Average Annual Rainfall	707 mm
Accumulated Temperature	1461 degree days
Field Capacity Level	145 days
Land Use	Rough Grazing
Slope and Aspect	2 degrees NE

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 24	MCL	10YR43 00	2	3	HR					
24- 46	MCL	10YR54 53	0	3	HR	C	MDCSAB	FR	M	
46- 64	HCL	10YR52 51	0	10	HR	C	WKCSAB	FR	M	
64-100	C	10YR52 00	0	10	HR	C	WKCAB	FM	P	

Wetness Grade 3A

Wetness Class	III
Gleying	24 cm
SPL	46 cm

Drought Grade

APW	mm	MBW	0 mm
APP	mm	MBP	0 mm

FINAL ALC GRADE 3A
MAIN LIMITATION Wetness

program ALC012 LIST OF BORINGS HEADERS 07/05/96 MAIDSTONE BLP SITE 96 page 1

SAMPLE NO	GRID REF	USE	ASPECT	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	TQ79405418	RGR	NE	1	25	25	4	3B	73	-44	73	-39	38			Y	DS	4	IMP 50 - DIST
1P	TQ79505407	RGR	NE	2	24	46	3	3A		0		0					WE	3A	PIT 80 AUG 100
2	TQ79505407	RGR	NE	2	47	47	3	3A		0		0					WE	3A	IMP 70 SLGLEY

program ALC011 COMPLETE LIST OF PROFILES 07/05/96 MAIDSTONE BLP SITE 96 page 1

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	STR	POR	IMP	SUBS SPL	CALC	
1	0-25	mcl	10YR42 00						0	0	HR	3							
	25-50	c	25Y 62 00	75YR58 00	M		00MN00	00 Y	0	0	HR	10		P		Y			IMP STONES ETC 50
1P	0-24	mcl	10YR43 00						2	0	HR	3							
	24-46	mcl	10YR54 53	10YR56 00	C			Y	0	0	HR	3	MDCSAB	FR	M				
	46-64	hcl	10YR52 51	10YR58 00	C			Y	0	0	HR	10	WKCSAB	FR	M	Y	Y		PIT TO 80
	64-100	c	10YR52 00	10YR58 00	C			Y	0	0	HR	10	WKCAB	FM	P	Y	Y		PIT IMP TO AUG @100
2	0-28	mcl	10YR43 00						0	0	HR	3							
	28-47	mcl	10YR44 00	10YR56 00	C			S	0	0	HR	3		M					SLIGHTLY GLEYED
	47-70	c	10YR53 00	10YR58 00	C			Y	0	0	HR	10		P		Y			IMP STONES 70