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Maidstone Borough Local Plan
Site 98 Land north of Sutton Road, Otham
Agricultural Land Classification
ALC Map and Report
March 1996

Resource Planning Team
Guildford Statutory Group
ADAS Reading

ADAS Reference 2007/030/96
MAFF Reference EL 20/862
LUPU Commission 02430

AGRICULTURAL LAND CLASSIFICATION REPORT

MAIDSTONE BOROUGH LOCAL PLAN
SITE 98 LAND NORTH OF SUTTON ROAD, OTHAM

Introduction

1 This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 4 1 hectares of land north of Sutton Road Otham in Kent The survey was carried out during March 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 Local Plan This site was previously surveyed in October 1988 (ADAS Ref 2007/044/88 Site H) in connection with the Local Plan This site has been re-surveyed in accordance with revised guidelines The results of this more recent 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 majority of the eastern part of the site was in horticultural use with the west of the site under scrub and young trees and a small strip to the far east of the site was also scrub

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)	% Site Area	% Surveyed Area
3a	1 5	36 6	71 4
3b	0 6	14 6	28 6
Other Land	2 0	48 8	
Total Surveyed Area	2 1		100 0
Total Site area	4 1	100 0	

7 The fieldwork was conducted at an average density of approximately 1 boring per hectare A total of 4 borings and one soil pit were described

8 The land at this site has been classified as Subgrade 3a (good quality) and Subgrade 3b (moderate quality) on the basis of a soil wetness limitation Land classified as Subgrade 3a lies to the south-east of the site Soils consist of very slightly to slightly stony medium clay loam topsoils over similar permeable medium silty clay loam upper subsoils These in turn overlie slowly permeable clay subsoils This results in impeded drainage and this land is limited to Subgrade 3a by a moderate soil wetness limitation

9 Land classified as Subgrade 3b lies to the north east of the site Soils consist of very slightly stony medium clay loam topsoils overlying slowly permeable clay subsoils This results in poor drainage conditions and a severe wetness limitation on this land

Climate

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

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

12 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

13 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

14 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

Table 2 Climatic and altitude data

Factor	Units	Values
Grid reference	N/A	TQ 792 523
Altitude	m, AOD	101
Accumulated Temperature	day°C	1393
Average Annual Rainfall	mm	710
Field Capacity Days	days	145
Moisture Deficit Wheat	mm	110
Moisture Deficit, Potatoes	mm	103

Site

15 The agricultural land at this site lies at an altitude of approximately 100m AOD The site is level Nowhere on the site does gradient or microrelief affect the land quality

Geology and soils

16 The published geological information for the site (BGS 1978) shows the site to be underlain by Hythe Beds with a small area of head brickearth in the far north-east corner

17 The most detailed published soils information for the site (SSEW 1983) shows the site to comprise soils of the Malling association These are described as fine loamy typical argillic brown earths over sandy limestone locally known as ragstone at varying depths below 80 cm, usually with a thin clayey pug layer at the junction (SSEW 1983) Soils of this broad type were found across the site (SSEW 1984)

Agricultural Land Classification

18 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

19 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

20 Land of good quality has been mapped over the centre and south of the agricultural land The principal limitation is soil wetness

21 The soils in this area comprise a slightly stony (8% total hard sandstone) medium clay loam topsoil overlying a similarbut slightly gleyed or gleyed upper subsoil in turn over a very slightly stony (1-5% total hard sandstone) gleyed and slowly permeable clay subsoil to depth The slowly permeable horizons have the effect of restricting water flow through the soil profile causing drainage to be impeded The depth at which these horizons occur in combination with the local climate means the soils fall into Wetness Class III and subsequently Subgrade 3a, given the workability of the topsoil textures encountered 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

Subgrade 3b

22 Land of moderate quality has been mapped in a single unit to the north of the site The principal limitation to land quality is soil wetness

23 Soils in this area comprise a very slightly stony (5% total hard stones) medium clay loam topsoil This passes to a very slightly stony (2% total hard stones) gleyed slowly permeable clay subsoil to depth The depth at which these horizons occur in combination with

the local climate means the soils are poorly drained falling into Wetness Class IV Subgrade 3b given the workability of the topsoil textures encountered 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

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SOURCES OF REFERENCE

British Geological Survey (1978) *Sheet 288 Maidstone Solid and Drift Edition 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) *Soils of South East England. 1 250 000 Scale* SSEW Harpenden

Soil Survey of England and Wales (1984) Bulletin 15 Soils and Their Use in South East England SSEW Harpenden

APPENDIX III

SOIL DATA

Contents

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

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 BLP SITE 98 Pit Number 1P

Grid Reference TQ79305240

Average Annual Rainfall	710 mm
Accumulated Temperature	1393 degree days
Field Capacity Level	145 days
Land Use	Horticultural Crops
Slope and Aspect	degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 27	MCL	10YR53 00	4	8	HR					
27- 52	MZCL	10YR63 00	0	15	HR	C	MDCSAB	FR	M	
52- 70	HZCL	10YR63 00	0	5	HR	M	WKCPL	FR	P	
70- 90	C	10YR63 00	0	0		M	MDCPL	FM	P	

Wetness Grade 3A

Wetness Class	III
Gleying	027 cm
SPL	052 cm

Drought Grade 3A

APW	105mm	MBW	-5 mm
APP	102mm	MBP	-1 mm

FINAL ALC GRADE 3A
MAIN LIMITATION Wetness

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
1P	TQ79305240	HRT		027	052		3	3A	105	-5	102	-1	3A				WE	3A	At boring 4
2	TQ79305240	HRT		030	030		4	3B	000	0	000	0					WE	3B	
4	TQ79305230	HRT		030	050		3	3A	000	0	000	0					WE	3A	

				----MOTTLES-----			PED		----STONES----				STRUCT/	SUBS			
SAMPLE	DEPTH	TEXTURE	COLOUR	COL	ABUN	CONT	COL	GLEY	>2	>6	LITH	TOT	CONSIST	STR	POR	IMP	SPL	CALC
1P	0-27	mcl	10YR53 00						4	0	HR	8						
	27-52	mzcl	10YR63 00	75YR58 00	C			Y	0	0	HR	15	MDCSAB	FR	M			
	52-70	hzcl	10YR63 00	75YR58 00	M			Y	0	0	HR	5	WKCPL	FR	P			Y
	70-90	c	10YR63 00	05YR63 00	M			Y	0	0		0	MDCPL	FM	P			Y
2	0-30	mcl	10YR42 00						0	0	HR	5						
	30-70	c	10YR73 00	75YR58 00	C			Y	0	0	HR	2			P			Y
4	0-30	mcl	10YR42 00						0	0	HR	5						
	30-50	mcl	10YR42 00	10YR58 00	C			Y	0	0	HR	3						
	50-80	hcl	10YR73 00	10YR58 00	C			Y	0	0	HR	1			P			Y