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Maidstone Borough Local Plan

Site 8 Land adjacent to Salt's Avenue, Loose

Agricultural Land Classification

ALC Map and Report

July 1994

AGRICULTURAL LAND CLASSIFICATION REPORT

MAIDSTONE BOROUGH LOCAL PLAN
SITE 8 LAND ADJACENT TO SALT'S AVENUE, LOOSE

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 8 comprises approximately 13 hectares of land to the north of Salt's Avenue south of the village of Loose An Agricultural Land Classification (ALC) survey was carried out during July 1994 The survey was undertaken at a detailed level of approximately one boring per hectare A total of 11 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 overgrown unmanaged rough grassland An area of non agricultural land exists in the west of the site consisting of scrub and semi mature 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
3a	3 1	23 9	27 0
3b	8 4	64 6	73 0
Non-agricultural	1 5	11 5	100% (11 5 ha)
Total area of site	13 0	100%	

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 Subgrade 3b moderate quality with soil wetness as the main limitation All of the borings in this mapping unit proved impenetrable below the topsoil A subsequent soil inspection pit showed the existence of a slowly permeable clay subsoil becoming stonier with depth which significantly impedes soil drainage The remainder of the agricultural land on the site has been classified as Subgrade 3a good quality land, with soil droughtiness as the main limitation Soils in this mapping unit tend to be of a lighter texture better drained and less stony than elsewhere on the site However these soils show a a moderate droughtiness limitation due to a combination of soil textures structures and the local climatic regime causing a restriction on profile available water

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 However the field capacity days for the site are relatively low in a regional context and therefore the likelihood of any soil wetness problems may be decreased

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

Table 2 Climatic Interpolations

Grid Reference	TQ 760516	TQ 760513
Altitude (m)	85	100
Accumulated Temperature (degree days Jan-June)	1418	1395
Average Annual Rainfall (mm)	696	703
Field Capacity (days)	141	142
Moisture Deficit Wheat (mm)	114	112
Moisture Deficit Potatoes (mm)	109	106
Overall Climatic Grade	1	1

3 Relief

3 1 The site lies at an altitude ranging between 80-100 m AOD A gently sloping dry valley feature runs north south towards the east of the site Nowhere on the site do gradient or relief affect agricultural land quality

4 Geology and Soil

4 1 The relevant geological sheet (BGS 1976) shows the entire site to be underlain by Hythe Beds

4 2 The published Soil Survey map (SSEW 1983) shows the soils on the site to comprise those of the Malling association These soils are described as well drained non-calcareous fine loamy soils over limestone at variable depths Some fine loamy soils with slowly permeable subsoils with slight seasonal waterlogging (SSEW 1983)

4 3 Detailed field examination found the soils over much of the site to be impenetrable at shallow depths with a slowly permeable clay subsoil interbedded with limestone over much of the site

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

Subgrade 3a

5 3 Good quality land has been mapped towards the west of the site running in a band from north to south along a dry valley feature Soil profiles tend to comprise a slightly stony (10 15% total hard limestone) medium silty clay loam topsoil overlying a similarly textured very slightly stony (2-5% total hard limestone) upper subsoil which rests upon a heavy silt clay loam lower subsoil Lower subsoils are variably stony (5 25% total hard limestone) proving impenetrable to the auger at depths of between 60 100cm Some of the profiles within this mapping unit show evidence of a slight wetness imperfection in the form of gleying although subsoils tend not to be slowly permeable A combination of soil textures structures stone contents and the local climatic regime means that there is a moderate restriction on the amount of profile available water for plant growth This will have a consequent effect upon crop yields such that a classification of Subgrade 3a is appropriate

Subgrade 3b

5 4 Agricultural land on the remainder of the site has been classified as Subgrade 3b moderate quality land Soil augerings within this mapping unit proved to be impenetrable below a variably stony non-calcareous medium silty clay loam topsoil at depths of between 30 35 cm A subsequent soil inspection pit (Pit no 1) was dug towards the east of the site to assess the nature of the subsoil The soil profile was found to comprise a slightly stony (15% total hard limestone 8%> 2cm in size) medium silty clay loam topsoil This overlies a similar textured moderately stony (25% total hard limestone) upper subsoil which in turn rests upon a clay lower subsoil commencing at 35cm The clay horizon varies in stone content being moderately stony (20% total hard limestone) to a depth of 85cm and very stony (40% total hard limestone) below this Limestone in the subsoil tends to be flaggy in nature and sandy intercalations were found to be present within the soil matrix The clay shows signs of wetness in the form of gleying and the less stony clay horizon was found to be poorly structured and slowly permeable thereby impeding drainage Such drainage characteristics equate this soil profile to Wetness Class IV with a resultant classification of Subgrade 3b Poorly drained wet soils can inhibit plant growth and development and can also be susceptible to structural damage through trafficking by agricultural machinery and poaching by grazing livestock

5 5 The impenetrable nature of the soils on this site means that a number of assumptions have had to be made drawn from observations made at pit no 1 regarding the classification of land elsewhere on the site It has been assumed that a worst case scenario of a slowly permeable clay subsoil at shallow depths prevails within this mapping unit such that an overall classification of Subgrade 3b is appropriate

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	**LLY**	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

T 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 8 Pit Number 1P

Grid Reference TQ76105145 Average Annual Rainfall 696 mm
Accumulated Temperature 1418 degree days
Field Capacity Level 142 days
Land Use Rough Grazing
Slope and Aspect degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 28	MZCL	10YR64 00	8	15	HR					
28- 35	MZCL	10YR54 00	0	25	HR		MDCSAB	FR	M	
35- 85	C	75YR53 00	0	20	HR	C	WKCSAB	FM	P	
85-120	C	75YR53 00	0	40	HR	C			M	

Wetness Grade 3B Wetness Class IV
Gleying 035 cm
SPL 035 cm

Drought Grade 3A APW 108mm MBW -5 mm
APP 92 mm MBP 16 mm

FINAL ALC GRADE 3B
MAIN LIMITATION Wetness

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL	GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC	
1P	0-28	mzcl	10YR64 00						8	0	HR	15							
	28-35	mzcl	10YR54 00						0	0	HR	25	MDCSAB FR	M					
	35-85	c	75YR53 00	75YR58 00	C			Y	0	0	HR	20	WKCSAB FM	P	Y		Y		
	85-120	c	75YR53 00	75YR58 00	C			Y	0	0	HR	40		M					STONY STRUCTURE
2	0 25	mzcl	10YR43 00						4	0	HR	10							
	25-60	hzcl	10YR53 00	10YR58 72	C			Y	0	0	HR	5		M					
	60-100	scl	10YR53 00	10YR58 71	M			Y	0	0	HR	5		P			Y		IMP HARD LIMESTONE
3	0-25	mzcl	10YR43 00						8	0	HR	15							
	25-30	mzcl	10YR54 00						0	0	HR	10		M					IMP HARD LIMESTONE
5	0-30	mzcl	10YR43 00						7	0	HR	15							
	30 40	mzcl	10YR44 00						0	0	HR	2		M					
	40-70	hzcl	10YR54 00	75YR56 00	C			S	0	0	HR	8		M					IMP HARD LIMESTONE
6	0-27	mzcl	10YR43 00						12	0	HR	20							
	27-35	mzcl	10YR54 00						0	0	HR	25		M					IMP HARD LIMESTONE
7	0-32	mzcl	10YR42 00						3	0	HR	10							
	32-40	mzcl	10YR54 00	10YR58 00	C			S	0	0	HR	5		M					
	40-60	hzcl	10YR52 00	10YR58 00	C			Y	0	0		0		M					IMP HARD LIMESTONE
8	0-25	mzcl	10YR42 00						2	0	HR	10							
	25-45	mzcl	10YR53 00						0	0	HR	2		M					
	45-90	hzcl	10YR54 00						0	0	HR	5		M					
	90-100	hzcl	10YR54 00						0	0	HR	25		M					IMP HARD LIMESTONE
9	0-20	mzcl	10YR44 00						13	0	HR	20							
	20-30	mzcl	10YR56 00						0	0	HR	25		M					IMP HARD LIMESTONE
10	0-20	mzcl	10YR43 00						12	4	HR	25							
	20-30	hzcl	10YR54 00						0	0	HR	20		M					IMP HARD LIMESTONE
11	0 30	mzcl	10YR43 00						7	0	HR	15							
	30 35	mzcl	10YR42 00						0	0	HR	20		M					IMP HARD LIMESTONE
12	0-30	mzcl	10RY53 00						6	0	HR	12							IMP HARD LIMESTONE
13	0-22	mzcl	10YR53 00						6	0	HR	15							
	22-30	hzcl	10YR63 00	05YR56 00	C			Y	0	0	HR	10		M					IMP HARD LIMESTONE

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	TQ76105145	RGR			035	035	4	3B	108	-5	92	-16	3A				WE	3B	
2	TQ76005160	RGR			025	060	3	3A	124	11	112	4	2				WE	3A	
3	TQ76125157	RGR					4	3B	48	-65	48	-60	4				WE	3B	I30 SEE1P
5	TQ76005150	RGR			040		1	1	100	-13	113	5	3A				DR	3A	IMPEN 70
6	TQ76105150	RGR					4	3B	52	-61	52	-56	4				WE	3B	I35 SEE1P
7	TQ75805140	RGR			040		1	1	95	-18	102	-6	3A				DR	3A	IMPEN 60
8	TQ75905140	RGR					1	1	130	17	117	9	2				DR	2	IMPEN100
9	TQ76005140	RGR					4	3B	44	-69	44	-64	4				WE	3B	I30 SEE1P
10	TQ76105140	RGR					4	3B	43	-70	43	-65	4				WE	3B	I30 SEE1P
11	TQ75905130	RGR					4	3B	56	57	56	-52	4				WE	3B	I35 SEE1P
12	TQ76005130	RGR					4	3B	51	-62	51	-57	4				WE	3B	I30 SEE1P
13	TQ76105130	RGR			022		2	2	48	65	48	-60	4				WE	3B	I30 SEE1P