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Maidstone Borough Local Plan
Site 64 Land south of Westfield Sole Road, Boxley
Agricultural Land Classification
ALC Map and Report
April 1995

AGRICULTURAL LAND CLASSIFICATION REPORT

MAIDSTONE BOROUGH LOCAL PLAN
SITE 64 LAND SOUTH OF WESTFIELD SOLE ROAD, BOXLEY

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 Maidstone Borough of Kent The work forms part of MAFF s statutory input to the Maidstone Borough Local Plan

1 2 Site 64 comprises approximately 24 hectares of land south of Westfield Sole Road at Boxley in Kent An Agricultural Land Classification (ALC) survey was carried out in April 1995 The survey was undertaken at a detailed level of approximately one boring per hectare A total of 13 borings one soil inspection pit and six topsoil stone measurements were assessed according to 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 long-term limitations 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 the survey the agricultural land on the site comprised cereals and oilseed rape Areas marked as urban include private dwellings woodland is also shown on the map An area on the site has not been surveyed due to difficulties in contacting the landowner to arrange access

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 Area
3a	4 3	17 6	39 0
3b	6 7	27 5	61 0
Woodland	8 4	34 4	100% (11 0 ha)
Urban	2 0	8 2	
Not surveyed	3 0	12 3	
Total area of Site	24 4	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 this site has been classified as Subgrade 3b moderate quality with topsoil stone contents as the main limitation Topsoil stone measurements in this mapping unit found topsoils containing in excess of 15% total stones greater than 2 or 6 cm Excessively stony topsoils may restrict crop establishment and growth, and can increase production costs due to increased wear and tear on machinery and tyres The remainder of agricultural land on the site has been classified as Subgrade 3a due to a droughtiness limitation A combination of soils textures 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 can affect the level and consistency of crop yields such that a classification of Subgrade 3a is appropriate Furthermore a less severe topsoil stone limitation also results in Subgrade 3a land in this mapping unit

2 Climate

2 1 The climatic criteria are considered first when classifying land as climate can be overriding in the sense that severe climatic 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 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 However climatic factors do interact with soil factors to influence soil wetness and droughtiness limitations At this location the field capacity days are relatively low in a regional context and therefore the likelihood of any soil wetness problems may be decreased

2 5 No local climatic factors such as exposure or frost risk are believed to affect the site

Table 2 Climatic Interpolation

Grid Reference	TQ 784 617
Altitude (m)	160
Accumulated Temperature (day degrees Jan-June)	1321
Average Annual Rainfall (mm)	694
Field Capacity (days)	141
Moisture Deficit Wheat (mm)	101
Moisture Deficit Potatoes (mm)	92
Overall Climatic Grade	1

3 Relief

3 1 The site is gently undulating lying at an altitude of approximately 155-170m AOD Nowhere on the site do altitude or relief pose any limitation to agricultural use

4 Geology and Soils

4 1 The published geological map (BGS 1977) shows the entire site to be underlain by Clay with Flints

4 2 The published Soil Survey map (SSEW 1983) shows the soils on the site to comprise those of the Batcombe association These are described as fine silty over clayey and fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging Some well drained clayey soils over chalk Variably flinty (SSEW 1983)

4 3 Detailed field examination found the soils on the site to be silty over clayey with variably flinty topsoils and subsoils

5 Agricultural Land Classification

5 1 The location of the soil observation points are shown on the attached sample point map

Subgrade 3a

5 2 Approximately 4 hectares of land towards the eastern edge of the site has been classified as Subgrade 3a, good quality land with soils droughtiness as the main limitation This area of land lies at a lower level than elsewhere on the site and topsoils were observed to be appreciably less stony Soil auger observations proved impenetrable below the topsoil and therefore a soil inspection pit (pit no 1) was dug to assess the stoniness of the subsoils At the location of the pit a slightly stony (11% total flints v/v) medium silty clay loam topsoil extending to 28cm was found to overlie a similar textured upper subsoil extending to 53cm Stone contents in the upper subsoil varies containing 20% total flints v/v to a depth of 40cm and 30% total flints v/v to a depth of 53cm The lower subsoil comprises a heavy silty clay loam containing 35% total flints v/v to a depth of 75cm and 45% total flints v/v below this depth The stony nature of the subsoils means that assessments of soil structure were difficult and therefore a moderate substructural condition has been assumed for the subsoils Rooting was observed to a depth of 85cm and this depth has been used as the lower depth for the purposes of a soil droughtiness calculation Soil moisture balance calculations indicate that there is a restriction on the amount of profile available water for plant growth which can affect the level and consistency of crop yields Consequently a classification of Subgrade 3a is appropriate due to this moderate droughtiness limitation

Subgrade 3b

5 3 The remaining agricultural land surveyed on the site has been classified as Subgrade 3b moderate quality land with topsoil stoniness as the main limitation Within this mapping unit soils tend to comprise heavy or medium silty clay loam topsoils with high flint contents At the majority of soil observations in this mapping unit topsoils were found to contain more than 15% flints >2cm in size thereby limiting the land to Subgrade 3b The presence of a large volume of stones in the topsoil will result in additional wear and tear on agricultural machinery and tyres and may also affect crop establishment and quality

ADAS Ref 2007/099/95
MAFF Ref EL 20/862

Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1977) Sheet No 272 Chatham 1 50 000 Series (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[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	**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 OBJ SITE 64 Pit Number 1P

Grid Reference TQ78406180 Average Annual Rainfall 688 mm
Accumulated Temperature 1333 degree days
Field Capacity Level 140 days
Land Use Cereals
Slope and Aspect degrees

HORIZON	TEXTURE	COLOUR	STONES	2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 28	MZCL	10YR43 00	7		11	HR					
28- 40	MZCL	10YR54 00	0		20	HR		MDCSAB	FR	M	
40- 53	MZCL	10YR54 00	0		30	HR			FR	M	
53- 75	HZCL	75YR53 54	0		35	HR			FR	M	
75- 85	HZCL	75YR54 00	0		45	HR				M	

Wetness Grade 1 Wetness Class I
Gleying cm
SPL No SPL

Drought Grade 3A APW 099mm MBW 4 mm
APP 099mm MBP 6 mm

FINAL ALC GRADE 3A
MAIN LIMITATION Droughtiness

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	TQ78506200	CER					1	2	046	-57	046	-49	4				ST	3B	IFLNTS30
1P	TQ78406180	CER					1	1	099	4	099	6	3A				DR	3A	PIT 90
1S	TQ78406190	CER					1	2	000	0	000	0					ST	3B	TS ONLY
2	TQ78306190	CER					1	1	050	-53	050	-45	4				ST	3B	IFLNTS35
2S	TQ78206180	OSR					1	1	000	0	000	0					ST	3A	AT AB6
3	TQ78406190	CER					1	1	055	-48	055	-40	3B				ST	3B	IFLNTS40
3S	TQ78106180	OSR					1	1	000	0	000	0					ST	3B	AT AB5
4	TQ78506190	CER					1	2	059	-44	059	-36	3B				DR	3A	SEE 1P
4S	TQ78536167	OSR					1	1	000	0	000	0					ST	3B	TS ONLY
5	TQ78106180	OSR		030			2	2	120	17	097	2	2				ST	3B	NOT IMP
5S	TQ78486196	CER					1	1	000	0	000	0					ST	3A	TS ONLY
6	TQ78206180	OSR					1	1	076	27	076	-19	3B				DR	3B	IFLNTS50
6S	TQ78326179	OSR					1	1	000	0	000	0					ST	3B	NR AB7
7	TQ78306180	OSR					1	1	049	54	049	-46	4				ST	3B	IFLNTS35
8	TQ78406180	CER					1	1	051	52	051	-42	4				DR	3A	SEE 1P
9	TQ78506180	CER					1	1	068	35	068	-25	3B				DR	3A	SEE 1P
14	TQ78226172	OSR		S35	035		3	3A	078	25	081	-12	3B				DR	3B	I55WE TS
15	TQ78296168	OSR					1	1	040	63	040	-53	4				DR	3A	SEE 1P
16	TQ78406169	OSR					1	1	063	40	063	-30	3B				DR	3A	SEE 1P
17	TQ78506159	CER					1	1	041	62	041	-52	4				DR	3A	SEE 1P

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	
1	0-30	hzcl	10YR43 00						16	0	HR	20						Y	IMPEN FLINTS
1P	0 28	mzcl	10YR43 00						7	0	HR	11							
	28-40	mzcl	10YR54 00						0	0	HR	20	MDCSAB	FR	M				
	40-53	mzcl	10YR54 00						0	0	HR	30		FR	M				
	53 75	hzcl	75YR53 54						0	0	HR	35		FR	M				
	75-85	hzcl	75YR54 00						0	0	HR	45			M				ROOTS TO 85
1S	0-25	hzcl	10YR43 00						18	0	HR	25							
2	0-28	mzcl	10YR43 00						18	0	HR	22							
	28-35	c	75YR58 00						0	0	HR	30			M				IMPEN FLINTS
2S	0-25	mzcl	10YR43 00						11	7	HR	16							
3	0-28	mzcl	10YR43 00						18	0	HR	25							
	28-40	c	75YR58 00						0	0	HR	25			M				IMPEN FLINTS
3S	0-25	mzcl	10YR43 00						22	10	HR	35							
4	0-28	hzcl	10YR43 00						12	0	HR	18							
	28-40	c	75YR58 00						0	0	HR	25			M				IMPEN FLINTS
4S	0-25	mzcl	10YR43 00						17	5	HR	30							
5	0-30	mzcl	10YR43 00						22	10	HR	35							
	30-45	c	10YR53 54	75YR58 00	C		00MN00 00	Y	0	0	HR	15			M				
	45-120	c	25Y 53 00	75YR58 00	M		00MN00 00	Y	0	0	HR	5			M				
5S	0-25	mzcl	10YR42 00						11	0	HR	18							
6	0-28	mzcl	10YR43 00						10	7	HR	15							
	28-50	c	75YR56 58						0	0	HR	15			M				IMPEN FLINTS
6S	0-25	mzcl	10YR43 00						17	0	HR	28							
7	0-30	mzcl	10YR43 00						17	0	HR	25							
	30-35	c	75YR58 00						0	0	HR	35			M				IMPEN FLINTS
8	0-27	mzcl	10YR43 00						8	0	HR	10							
	27-30	mzcl	10YR44 00						0	0	HR	5			M				IMPEN FLINTS
9	0-30	mzcl	10YR43 00						7	0	HR	10							
	30-40	mzcl	10YR44 00						0	0	HR	5			M				IMPEN FLINTS
14	0-27	mzcl	10YR43 42						15	0	HR	16							
	27-35	mzcl	10YR54 00	00MN00 00	F				0	0	HR	5			M				
	35-55	c	75YR46 00	75YR58 62	C			S	0	0	HR	5			P		Y		IMPEN FLINTS

SAMPLE	DEPTH	TEXTURE	COLOUR	-- -MOTTLES-- --			PED	GLEY	----STONES----				STRUCT/	SUBS				
				COL	ABUN	CONT	COL		>2	>6	LITH	TOT	CONSIST	STR	POR	IMP	SPL	CALC
15	0-25	mzcl	10YR43 44						12	0	HR	16						IMPEN FLINTS
16	0-30	mzcl	10YR43 00						10	0	HR	15						
	30-40	mzcl	10YR54 00						0	0	HR	20		M				IMPEN FLINTS
17	0-25	mzcl	10YR43 00						12	0	HR	15						IMPEN FLINTS