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Maidstone Borough Local Plan
Site 42 Land at Heathfield,
Heath Road, Coxheath
Agricultural Land Classification
ALC Map and Report
August 1994

AGRICULTURAL LAND CLASSIFICATION REPORT

MAIDSTONE BOROUGH LOCAL PLAN
SITE 42 LAND AT HEATHFIELD, HEATH ROAD, COXHEATH

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

1 2 Site 42 comprises approximately 4 hectares of land to the north of Heath Road on the eastern edge of Coxheath Kent An Agricultural Land Classification (ALC) survey was carried out in August 1994 The survey was undertaken at a detailed level of approximately one boring per hectare of agricultural land A total of 6 borings and one soil inspection pit were assessed 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 the survey all of the agricultural land on the site comprised apple and pear orchards A small area of woodland is mapped towards the south west of the site

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 This map supersedes any previous survey information for this site

Table 1 Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site	% of Agricultural Land
2	0 8	17 7	19 5
3b	3 3	73 4	80 5
Woodland	0 4	8 9	100% (4 1 ha)
Total area of site	4 5	100%	

1 6 Appendix 1 gives a general description of the grades and land use categories identified in this survey The main classes are described in terms of limitation that can occur the typical cropping range and 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 land with soil droughtiness as the main limitation Medium textured soils overlie flaggy sandstone (Hythe Beds) at relatively shallow depth Profile available water is therefore severely restricted The remainder of the agricultural land has been classified as Grade 2 very good quality land due to a slight droughtiness limitation Subsoils in this mapping unit tend to much less stony than elsewhere on the site and therefore droughtiness restrictions are less severe

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 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 grid point 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 climatic factors do interact with soil properties to influence soil wetness and soil droughtiness limitations At this locality the climate is relatively warm and dry in national terms therefore the likelihood of soil droughtiness restrictions is enhanced

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

Table 2 Climatic Interpolation

Grid Reference	TQ749510
Altitude (m AOD)	120
Accumulated Temperature (degree days Jan June)	1373
Average Annual Rainfall (mm)	707
Field Capacity (days)	142
Moisture Deficit, Wheat (mm)	110
Moisture Deficit Potatoes (mm)	103
Overall Climatic Grade	1

3 Relief

3 1 The site lies at an altitude of 110 120 m AOD falling gently towards the north A small dry valley runs through the centre of the site with a north-south orientation Nowhere on the site do gradient or relief affect agricultural land quality

4 Geology and Soil

4 1 British Geological Survey (1976) shows the site to be underlain by sandy limestones and calcareous sands of the Hythe Beds towards the north and Head deposits across the southern part of the site

4 2 Soil Survey of England and Wales (1983) shows the site to comprise two soil associations Soils of the Malling association broadly coincide with the Hythe Beds these being described as *well drained fine loamy soils over limestone* at variable depths (SSEW 1983) Marlow association soils are shown to correspond with Head deposits These are described as well drained fine loamy over clayey and clayey soils (SSEW 1983)

4 3 Detailed field examination found the soils on the site to broadly fall into two types as described by the Soil Survey although the distribution was not as expected Shallow soils over the Hythe Beds were observed across most of the site whilst a small area of deeper profiles occurs towards the south west 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

Grade 2

5 3 Very good quality land has been mapped towards the south west and north of the site where soils are deeper and less stony than elsewhere Information from surveys of land neighbouring this site (ADAS Refs 2007/189/94 Site 43 and 2007/150/94 Site 14) has been used in the definition of this mapping unit Soils generally comprise medium silty clay loam topsoils which are non calcareous and may contain 5% total sandstone fragments by volume These overlie similar upper subsoils and pass to heavy silty clay loam lower subsoils below about 75 cm Profiles were found to be impenetrable (to soil auger) below about 85 cm as a result of very stony horizons containing 45-60% sandstone fragments as observed in the soil inspection pit examined on the site These relatively deep well drained (Wetness Class I) soils have slightly reduced reserves of profile available water as a result of the interaction between soil textures structures and stone contents with the relatively dry climatic regime Yield potential may be slightly depressed as a consequence

Subgrade 3b

5 4 Moderate quality land represents the majority of the agricultural land surveyed it being affected by severe soil droughtiness restrictions

Profiles typically comprise non calcareous silt loam medium clay loam or medium silty clay loam topsoils containing 5 and 20% total sandstone fragments by volume (3 8% of which are >2 cm in size) All profiles were impenetrable to a soil auger below the topsoil between 20 and 30 cm depth However a soil inspection pit (1p) showed subsoils to comprise heavy silty clay loam textures and to be very stony containing 45 60% sandstone brash by volume derived from weathering Hythe Beds Rooting was only evident to 60 cm The high stone contents of these subsoils and the restricted rooting depth act to reduce profile available water significantly As a result severe soil droughtiness affects the land leading to the possibility of drought stress and reduced yield potential to the extent that Subgrade 3b is appropriate

ADAS Ref 2007/188/94
MAFF Ref EL20/328

Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1976) Sheet No 288 Maidstone 1 50 000 Solid & 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) Climatic datasets for Agricultural Land Classification

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

Soil Survey of England and Wales (1984) Soils and their use in South East England Bulletin No 15

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	**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 us ng 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 42 Pit Number 1P

Grid Reference TQ74905110 Average Annual Rainfall 703 mm
Accumulated Temperature 1384 degree days
Field Capacity Level 142 days
Land Use
Slope and Aspect 02 degrees NE

HORIZON	TEXTURE	COLOUR	STONES	2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 21	MZCL	10YR52 00	8		10	HR					
21- 45	HZCL	10YR64 73	0		45	HR				M	
45 60	HZCL	75YR54 58	0		60	HR				M	

Wetness Grade 1 Wetness Class I
Gleying cm
SPL No SPL

Drought Grade 3B APW 067mm MBW 44 mm
APP 070mm MBP 34 mm

FINAL ALC GRADE 3B
MAIN LIMITATION Droughtiness

SAMPLE NO	GRID REF	USE	ASPECT	GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M DRT	REL FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1	TQ74905120	ORC	N	01			1	1	047	64	047	-57	4				DR	3B	IMP 30 SEE 1P
1P	TQ74905110	ORC	NE	02			1	1	067	44	070	-34	3B				DR	3B	ROOTING TO 60
2	TQ74955120	ORC					1	1	044	67	044	-60	4				DR	3B	IMP 20 SEE 1P
3	TQ74905110	ORC	E	02			1	1	037	-74	037	-67	4				DR	3B	IMP 25 SEE 1P
4	TQ75005110	ORC					1	1	055	-56	055	-49	4				DR	3B	IMP 25 SEE 1P
5	TQ74905100	ORC	NE	02			1	1	119	8	118	14	2				DR	2	IMP 85
6	TQ74975100	ORC					1	1	036	-75	036	68	4				DR	3B	IMP 20 SEE 1P

SAMPLE	DEPTH	TEXTURE	COLOUR	- - MOTTLES COL	ABUN	CONT	PED COL	GLEY	----STONES >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
1	0-25	mcl	10YR43 53						3	0	HR	10							
	25-30	mcl	10YR56 00						0	0	HR	30		M					Imp hard sandst
1P	0-21	mzcl	10YR52 00						8	0	HR	10							
	21-45	hzcl	10YR64 73						0	0	HR	45		M					
	45 60	hzcl	75YR54 58						0	0	HR	60		M					Rooting to 60
2	0-20	zl	10YR43 00						0	0	HR	5							Imp hard sandst
3	0-25	mcl	10YR53 00						6	0	HR	20							Imp hard sandst
4	0-25	zl	10YR43 00						0	0	HR	5							Imp hard sandst
5	0-25	mzcl	10YR53 00						0	0	HR	5							
	25-75	mzcl	10YR54 00						0	0	HR	5		M					
	75-85	hzcl	10YR54 00						0	0	HR	5		M					Imp hard sandst
6	0-20	mzcl	10YR43 00						0	0	HR	5							Imp hard sandst