A1

Maidstone Borough Local Plan
Site 7 Land North of Howland Road, Marden
Agricultural Land Classification
ALC Map and Report
August 1994

AGRICULTURAL LAND CLASSIFICATION REPORT

MAIDSTONE BOROUGH LOCAL PLAN
SITE 7 LAND NORTH OF HOWLAND ROAD, MARDEN

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 7 comprises 3 hectares of land to the north east of Marden in Kent An Agricultural Land Classification (ALC) survey was carried out in July 1994 The survey was undertaken at a detailed level A total of 4 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 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 was unmanaged permanent grass The areas shown as Woodland were scrub and hawthorn woodland The areas of Urban are towards the west of the site a playing field and towards the east an area of garden associated with a house on Howland Road

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 ALC survey information for this site

Table 1 Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site	% of Agricultural Land
2	0 3	10 0	18 7
3a	1 3	43 4	81 3
Woodland	0 7	23 3	100% (1 6ha)
Urban	0 7	23 3	
Total area of Site	3 0ha	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 agricultural land at this site has been classified very good (Grade 2) and good quality (Subgrade 3a) Limitations include soil wetness and soil droughtiness Where soil droughtiness is the overriding limitation hard stones in the soil profile restrict available water capacity such that there is a slight to moderate risk of drought stress affecting plant growth and yield Where soil wetness occurs it is evidenced by gleyed horizons occurring at shallow depth occasionally overlying deep slowly permeable clay layers This causes drainage to be slightly impeded such that there is a slight restriction on the number of days when cultivations and/or stocking may occur without causing structural damage to the soil

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 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 No local climatic factors such as exposure or frost risk are believed to affect the site However climatic and soil factors interact to influence soil wetness and droughtiness limitations The local climatic parameters listed below in Table 2 show that the site is relatively dry in a national context and as such has relatively high moisture deficits for crops

Table 2 Climatic Interpolation

Grid Reference	TQ750446
Altitude (m AOD)	30
Accumulated Temperature (°days Jan -June)	1478
Average Annual Rainfall (mm)	662
Field Capacity Days	136
Moisture deficit wheat (mm)	125
Moisture deficit potatoes (mm)	122
Overall Climatic Grade	1

3 Relief

3 1 The site lies at an altitude of 29 30m AOD Overall it is flat Nowhere on the site does relief or gradient affect agricultural land quality

4 Geology and Soils

4 1 The published geological information (BGS 1976) shows the entire site to be underlain by Cretaceous Weald Clay

4 2 The published soils information (SSEW 1980 1983 and 1984) shows the site to be underlain by soils of the Wickham 1 Association The legend accompanying the map describes these as slowly permeable seasonally waterlogged fine silty over clayey fine loamy over clayey and clayey soils (SSEW 1983) Soils at this site commonly comprise clay loam topsoils and subsoils occasionally passing to clay at depth commonly with stony horizons in the subsoil

5 Agricultural Land Classification

5 1 Paragraph 1 5 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 Land of very good quality has been mapped towards the east of the site Principal limitations include soil wetness and soil droughtiness both of which occur to a similar degree in this area Soil wetness is evidenced by stoneless gleyed clay upper subsoils occurring at shallow depth beneath stoneless medium clay loam topsoils restricting the area to Wetness Class II (See Appendix II) The gleyed upper subsoil passes to a moderately stony (c 30% v/v sandstone fragments and flints) heavy clay loam horizon between 65 and 85cm This passes to a gleyed and slowly permeable clay lower subsoil horizon occurring to depth Within the prevalent local climatic parameters a profile such as this also results in a slight soil droughtiness limitation as the sandstone fragments and flints between 65 and 85cm in the heavy clay loam horizon restrict the available water capacity of the soil such that there is a slight risk of drought stress which affects plant growth and yield

Subgrade 3a

5 4 Land of good quality is shown for the majority of the agricultural land at this site and is located towards the centre of the site The principal limitation is soil droughtiness Profiles are typified by the pit observation 1p (see Appendix III) and typically comprise stoneless or very slightly stony (c 2% v/v sandstone fragments and flints) medium clay loam or medium silty clay loam topsoils These pass to similar upper subsoils which commonly contain slight evidence of wetness in the form of a few ochreous mottles within a pale matrix This overlies either a very slightly stony (c 5% v/v sandstone fragments and flints) gleyed or slightly gleyed medium clay loam horizon or a stoneless gleyed heavy clay loam horizon Both pass to a very stony (c 35-45% v/v sandstone fragments and flints) gleyed medium clay loam lower subsoil horizon which became impenetrable to the soil auger

between 90 and 100cm In the pit observation the stone content in the lower subsoil was measured at 45% v/v hard flint and sandstone fragments and became impenetrable at 90cm Assuming this horizon continues to 120cm this leads to Subgrade 3a being applied on the basis of soil droughtiness The hard stones in the profile restrict the available water capacity of the soil to the extent that there is a moderate risk of drought stress which may affect plant growth and development Within this mapping unit one observation was found to be of slightly better quality On further investigation this area was found to be the site of an old pond now disused and overgrown but it is still occasionally wetter than the surrounding area especially in winter

ADAS Ref 2007/153/94
MAFF Ref EL20/328

Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1976) Sheet 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 (1980) Soils of Kent Bulletin No 15 Map scale 1 250 000

Soil Survey of England and Wales (1983) Sheet No 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 (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

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 (e g 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 e g 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

DEFINITION OF SOIL WETNESS CLASS

Wetness Class I

The soil profile is not wet within 70 cm depth for more than 30 days in most years

Wetness Class 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 180 days but only wet within 40 cm depth for 31 90 days in most years

Wetness Class 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

Wetness Class IV

The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth fro 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

Wetness Class V

The soil profile is wet within 40 cm depth for 211 335 days in most years

Wetness Class VI

The soil profile is wet within 40 cm depth for more than 335 days in most 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 database This has commonly used notations and abbreviations as set out below

Boring Header Information

1 **GRID REF** national 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 measured by a hand held optical clinometer

4 **GLEY/SPL** Depth in cm to gleying or slowly permeable layers

5 **AP (WHEAT/POTS)** Crop adjusted available water capacity

6 **MB (WHEAT/POTS)** Moisture Balance

7 **DRT** Best grade according to soil droughtiness

8 If any of the following factors are considered significant an entry of 'Y will be entered in the relevant column

MREL Microrelief limitation	**FLOOD** Flood risk	**EROSN** Soil erosion risk
EXP Exposure limitation	**FROST** Frost	**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 **ST** Topsoil Stones
CH Chemical	**WE** Wetness	**WK** Workability
DR Drought	**ER** Erosion Risk	**WD** Soil Wetness/Droughtiness

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	**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 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

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

6 **STONE LITH** 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	**GH** gravel with non porous (hard) stones

SI soft weathered igneous/metamorphic rock
Stone contents (>2cm >6cm and total) are given in percentages (by volume)

7 **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

8 **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

9 **SUBS STR** Subsoil structural condition recorded for the purpose of calculating profile droughtiness **G** good **M** moderate **P** poor

10 **POR** Soil porosity If a soil horizon has less than 0 5% biopores >0 5 mm a Y will appear in this column

11 **IMP** If the profile is impenetrable a Y will appear in this column at the appropriate horizon

12 **SPL** Slowly permeable layer If the soil horizon is slowly permeable a Y will appear in this column

13 **CALC** If the soil horizon is calcareous a Y will appear in this column

14 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 7 Pit Number 1P

Grid Reference TQ74924463 Average Annual Rainfall 662 mm
Accumulated Temperature 1478 degree days
Field Capacity Level 136 days
Land Use Rough Grazing
Slope and Aspect degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 20	MCL	10YR43 00	0	2	HR					
20- 47	MCL	10YR56 00	0	2	HR	F	MDCSAB	FR	M	
47- 58	MCL	10YR53 00	0	5	HR	C	MDCSAB	FR	M	
58- 90	MCL	10YR44 00	0	45	HR	C		FR	M	

Wetness Grade 1 Wetness Class I
Gleying 47 cm
SPL cm

Drought Grade 3A APW 108mm MBW -17 mm
APP 106mm MBP -16 mm

FINAL ALC GRADE 3A
MAIN LIMITATION Droughtiness

SAMPLE NO	GRID REF	ASPECT USE	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	TQ75034460	RGR		30		2	2	156	31	118	-4	2				WD	2	OLD POND
1P	TQ74924463	RGR		47		1	1	108	17	106	-16	3A				DR	3A	PIT 82 IMPST90
2	TQ74924463	RGR				1	1	104	-21	114	-8	3B				DR	3A	IMP68 SLGLEY45
3	TQ75184466	PGR		28	85	2	2	136	11	115	-7	2				WD	2	SPL 85
4	TQ75084465	RGR		30		2	2	129	4	116	-6	3A				DR	3A	IMP 100 SEE 1P

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL	PED GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	IMP	SPL	CALC	
1	0-30	mcl	10YR42 00						0	0		0							
	30-45	mcl	25Y 51 00	75YR58 00	M			Y	0	0		0		M					
	45-60	hcl	25Y 51 61	75YR58 00	M			Y	0	0		0		M					NOT IMPENETRABLE
	60-120	hcl	25Y 62 00	75YR56 00	M			Y	0	0		0		M					SITE OF OLD POND
1P	0-20	mcl	10YR43 00						0	0	HR	2							
	20-47	mcl	10YR56 00	10YR56 00	F				0	0	HR	2	MDCSAB	FR	M				
	47-58	mcl	10YR53 00	10YR68 00	C		00MN00 00	Y	0	0	HR	5	MDCSAB	FR	M				PIT 82 IMP AUG 90
	58 90	mcl	10YR44 00	10YR68 00	C		00MN00 00	S	0	0	HR	45		FR	M				2mm SIEVED
2	0-20	mzcl	10YR43 00						0	0		0							
	20-45	mzcl	10YR46 00						0	0	HR	1		M					
	45-60	mcl	10YR54 00	10YR56 00	M		00MN00 00	S	0	0	HR	5		M					
	60-68	mcl	10YR54 00	10YR56 00	M		00MN00 00	S	0	0	HR	15		M					IMP HARD STONES 68
3	0-28	mcl	10YR43 00						0	0		0							
	28-65	c	25Y 51 52	10YR58 00	M			Y	0	0		0		M					
	65 85	hcl	10YR53 00	75YR68 00	M		00MN00 00	Y	0	0	HR	30		M					DIFF TO PENETRATE
	85-120	c	05Y 51 00	75YR58 00	M			Y	0	0		0		P			Y		WET CLAY DEF SPL
4	0-30	mcl	10YR43 00						0	0	HR	2							
	30 50	mcl	10YR53 52	10YR58 00	C			Y	0	0	HR	2		M					
	50 85	hcl	25Y 52 53	10YR68 00	M			Y	0	0		0		M					
	85 100	mcl	10YR53 00	10YR58 68	M		00MN00 00	Y	0	0	HR	35		M					IMP STONES 100