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Maidstone Borough Local Plan
Site 31 Land at Church Road, Otham
Agricultural Land Classification
ALC Map and Report
August 1994

AGRICULTURAL LAND CLASSIFICATION REPORT

MAIDSTONE BOROUGH LOCAL PLAN
SITE 31 LAND AT CHURCH ROAD, OTHAM

1 Summary

1 1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality for 47 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 31 comprises 15 3 hectares of land west of Church Road near the village of Otham An Agricultural Land Classification (ALC) survey was carried out during August 1994 The survey was undertaken at a detailed level of approximately one boring per hectare A total of 14 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 At the time of survey the land on the site had been recently harvested for peas

1 4 The site is shown on the attached ALC map which has been drawn at a scale of 1 10 00 It is accurate at this scale but any enlargement would be misleading

1 5 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 6 All of the land on the site (15 3 ha) has been classified as Grade 2 very good quality, because of a slight soil droughtiness limitation Topsoils typically comprise very slightly to slightly stony non-calcareous medium silty clay loams These overlie free draining similarly stony medium silty clay loams or heavy clay loam upper subsoils Lower subsoils generally comprise well drained moderately stony clays The interaction between the soil textures profile stone contents and climatic factors at this site may act to slightly restrict profile available water and subsequently plant growth and yield

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 in a regional context the crop adjusted soil moisture deficits are relatively high at this locality High soil moisture deficits increase the likelihood of soil droughtiness limitations

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

Table 1 Climatic Interpolations

Grid Reference	TQ786541	TQ788537
Altitude (m)	55	70
Accumulated Temperature (degree days Jan June)	1444	1427
Average Annual Rainfall (mm)	709	714
Field Capacity (days)	145	146
Moisture Deficit Wheat (mm)	115	113
Moisture Deficit Potatoes (mm)	110	107
Overall Climatic Grade	1	1

3 Relief

3 1 The site occupies gently undulating land falling through gradients of 1-3° from approximately 70m AOD along the southern site boundary to lie at approximately 55m AOD along the northern site boundary Neither gradient or relief impose any limitation to 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 (sandy limestone and calcareous sands)

4 2 The published Soil Survey map (SSEW 1983) shows the Fyfield 2 association at this site These soils are described as well drained coarse loamy and sandy soils over sands and sandstones Some very acid soils with a wet peaty surface horizon and iron pan in woodland or on moorland (SSEW 1983)

4 3 Detailed field examination found well drained loamy soils which become heavier and increasingly stony with depth across the entire site

5 Agricultural Land Classification

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

Grade 2

5 2 All of the land has been classed as very good quality because of a minor soil droughtiness limitation Topsoils typically comprise non calcareous medium silty clay loams and occasionally medium clay loams and silt loams The topsoils range from being very slightly to slightly stony containing approximately 1-4% flints >2cm and 4-10% total flints by volume These are generally underlain by medium silty clay loam, and also heavy clay loam, upper subsoils which contain similar flint contents to that of the topsoils Due to the very dry conditions at the time of survey all of the profiles proved impenetrable to a soil auger between 30 and 55 cm Consequently a soil inspection pit (1P) was dug to assess subsoil conditions at depth

5 3 From 1P it could be seen that the lower subsoils comprise free draining clays which are moderately to very stony containing approximately 35% total flints by volume The dry and stony subsoil conditions meant that the pit could only be described to a depth of 100 cm If the profile available water calculation is cut off at 100 cm depth then the resultant soil droughtiness classification is Subgrade 3a However it is a reasonable assumption that the soil resource continues to depth and that crop roots could exploit this resource As a result the land is deemed eligible for Grade 2 with a slight soil droughtiness limitation This limitation arises from the interaction between the soil textures and profile stone contents and the local regionally dry climatic regime Such a limitation may act to place minor restrictions on the range of crops which may be grown and also to impose a slight risk of drought stress for those crops which are grown

ADAS Ref 2007/194/94
MAFF Ref EL 20/328

Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

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	**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 **STRUC T** the degree of development size and shape of soil peds are described using the follc wing 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 loos **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 appropriate 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 31 Pit Number 1P

Grid Reference TQ78765395 Average Annual Rainfall 709 mm
Accumulated Temperature 1444 degree days
Field Capacity Level 145 days
Land Use
Slope and Aspect 01 degrees N

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 25	MZCL	10YR43 00	2	5	HR					
25- 57	HCL	10YR43 54	0	5	HR		MDCSAB	FM	M	
57-100	C	10YR42 56	0	35	HR			FM	M	

Wetness Grade 1 Wetness Class I
Gleying cm
SPL No SPL

Drought Grade 3A APW 113mm MBW -2 mm
APP 108mm MBP -2 mm

FINAL ALC GRADE 2
MAIN LIMITATION Droughtiness

SAMPLE NO	GRID REF	USE	ASPECT	GRDNT	- WETNESS GLEY SPL	CLASS	GRADE	WHEAT- AP	MB	-POTS- AP	MB	M REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1	TQ78605410	STB				1	1	58	-57	58	-52	4				DR	2	Imp 35 Re 1P
1P	TQ78765395	STB	N	01		1	1	113	-2	108	2	3A				DR	2	Pit70 Augd 100
2	TQ78705410	STB				1	1	76	-39	76	34	3B				DR	2	Imp 45 Re 1P
3	TQ78605400	STB	NE	01		1	1	74	-41	74	36	3B				DR	2	Imp 45 Re 1P
4	TQ78705400	STB	N	02		1	1	61	-54	61	49	4				DR	2	Imp 35 Re 1P
5	TQ78805400	STB	NW	01		1	1	76	39	76	-34	3B				DR	2	Imp 35 Re 1P
6	TQ78905400	STB	N	01		1	1	84	31	84	-26	3B				DR	2	Imp 50 Re 1P
7	TQ78605390	STB				1	1	60	55	60	-50	4				DR	2	Imp 30 Re 1P
8	TQ78705390	STB				1	1	69	46	69	-41	3B				DR	2	Imp 40 Re 1P
9	TQ78805390	STB				1	1	52	63	52	-58	4				DR	2	Imp 30 Re 1P
10	TQ78905390	STB				1	1	90	25	92	-18	3B				DR	2	Imp 55 Re 1P
11	TQ78605380	STB	N	02		1	1	53	-62	53	-57	4				DR	2	Imp 30 Re 1P
12	TQ78705380	STB	N	02		1	1	88	-27	88	-22	3B				DR	2	Imp 50 Re 1P
13	TQ78605370	STB				1	1	61	-54	61	-49	4				DR	2	Imp 35 Re 1P
14	TQ78705370	STB				1	1	54	-61	54	-56	4				DR	2	Imp 30 Re 1P
15	TQ78805370	STB	N	03		1	1	87	-28	87	23	3B				DR	2	Imp 50 Re 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 25	mzcl	10YR43 00						4	0	HR	10							
	25-35	mzcl	10YR54 00						0	0	HR	10		M					
1P	0-25	mzcl	10YR43 00						2	0	HR	5							
	25-57	hcl	10YR43 54						0	0	HR	5	MDCSAB	FM	M				
	57-100	c	10YR42 56						0	0	HR	35		FM	M				Imp100 2 to 120
2	0-20	mzcl	10YR43 00						2	0	HR	5							
	20-45	mzcl	10YR44 00						0	0	HR	8		M					
3	0-30	mcl	10YR42 00						1	0	HR	5							
	30-45	c	10YR42 00	00MN00	00	C			0	0	HR	5		M					
4	0-25	mzcl	10YR43 00						1	0	HR	4							
	25 35	mzcl	10YR44 00						0	0	HR	8		M					
5	0-25	mzcl	10YR43 42						2	0	HR	5							
	25-40	mzcl	10YR44 00						0	0	HR	8		M					
	40-45	mzcl	10YR44 00						0	0	HR	12		M					
6	0 27	mzcl	10YR43 00						2	0	HR	8							
	27-50	mzcl	10YR44 00						0	0	HR	8		M					
7	0 20	zl	10YR43 00						2	0	HR	4							
	20-30	mzcl	10YR44 00						0	0	HR	5		M					
8	0-25	mzcl	10YR43 00						3	0	HR	6							
	25 40	mzcl	10YR54 00						0	0	HR	5		M					
9	0-20	mzcl	10YR43 00						3	0	HR	5							
	20-30	mzcl	10YR44 00						0	0	HR	5		M					
10	0-25	mzcl	10YR43 00						2	0	HR	5							
	25 40	mzcl	10YR54 00						0	0	HR	5		M					
	40-55	hcl	10YR54 56	00MN00	00	C		S	0	0	HR	5		M					Sl gleyed
11	0-25	mzcl	10YR42 00						1	0	HR	4							
	25-30	hcl	10YR56 00						0	0	HR	8		M					
12	0 30	mzcl	10YR42 43						1	0	HR	4							
	30 50	mzcl	10YR54 44						0	0	HR	2		M					
13	0-25	mzcl	10YR43 00						3	0	HR	5							
	25-35	hcl	75YR56 00	00MN00	00	C			0	0	HR	5		M					
14	0 25	mzcl	10YR43 00						4	0	HR	8							
	25-30	zl	10YR44 00						0	0	HR	5		M					

				- MOTTLES --		PED		--STONES				STRUCT/	SUBS				
SAMPLE	DEPTH	TEXTURE	COLOUR	COL	ABUN	CONT	COL	GLEY	>2	>6	LITH	TOT	CONSIST	STR	POR	IMP	SPL	CALC
15	0 25	mzcl	10YR43 42						1	0	HR	4						
	25 50	mzcl	10YR44 00						0	0	HR	4				M		