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Swale Borough Local Plan
Objector Site Sitt 6,
Land at Grove End Farm,
Sittingbourne

Agricultural Land Classification
October 1996

Resource Planning Team
Guildford Statutory Group
ADAS Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

SWALE BOROUGH LOCAL PLAN
OBJECTOR SITE SITT 6,
LAND AT GROVE END FARM, SITTINGBOURNE

Introduction

1 This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of approximately 7 ha of land at Grove End Farm, Tunstall which is located on the southern side of Sittingbourne The survey was carried out in October 1996

2 The survey was commissioned by the Ministry of Agriculture Fisheries and Food (MAFF) from its Land Use Planning Unit in Reading in connection with the Swale Borough Local Plan This survey supersedes any previous ALC surveys on this land

3 The work was conducted under sub-contracting arrangements by NA Duncan and Associates and was supervised by members of the Resource Planning Team in the Guildford Statutory Group of ADAS The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF 1988) A description of the ALC grades and subgrades is given in Appendix I

4 At the time of survey the whole site was in permanent grass The area was a former orchard and a few cherry trees remain on site although the land is now currently being used for horse grazing

Summary

5 The findings of the survey are shown on the enclosed ALC map The map has been drawn at a scale of 1 10 000 It is accurate at this scale but any enlargement would be misleading

6 The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1

Table 1 Area of grades and other land

Grade/Other land	Area (hectares)	% Total site area	% Surveyed Area
2	2 8	41 2	41 2
3a	4 0	58 8	58 8
Total surveyed area	6 8		100 0
Total site area	6 8	100 0	

7 The fieldwork was conducted at an average density of 1 boring per hectare A total of 6 borings were described which were backed up by data from one soil inspection pit

8 The site comprises an area of Grade 2 very good quality agricultural land on the eastern side and Subgrade 3a, good quality agricultural land to the west Over the western half of the site fine silty over clayey soils overlying chalk at relatively shallow depth have been mapped Moisture balance calculations indicate that these soils will be moderately droughty especially for deeper rooting crops restricting the land quality to Subgrade 3a On the eastern side the soils are deeper and consequently there is only a minor droughtiness limitation resulting in a Grade 2 classification

Factors Influencing ALC Grade

Climate

9 Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics

10 The key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5km grid datasets using the standard interpolation procedures (Met Office 1989)

Table 2 Climatic and altitude data

Factor	Units	Values
Grid reference	N/A	TQ 891 616
Altitude	m AOD	67
Accumulated Temperature	day°C (Jan June)	1425
Average Annual Rainfall	mm	695
Field Capacity Days	days	140
Moisture Deficit, Wheat	mm	110
Moisture Deficit, Potatoes	mm	103

11 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

12 The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR) as a measure of overall wetness and accumulated temperature (ATO January to June) as a measure of the relative warmth of a locality

13 The combination of rainfall and temperature at this site mean that under this warm and relatively dry climate soils will require a moderately high available water capacity to avoid droughtiness limitations There is however no overall climatic limitation in this area

Site

14 The site is relatively flat and lies at an altitude of approximately 67 m AOD Nowhere on the site does gradient or micro-relief impose any limitation on the agricultural use of the area

Geology and soils

15 The published geological information for the area (BGS 1977) shows the site to be underlain by drift deposits of clay-with-flints a dark reddish brown clay containing many nodular flints which rests irregularly on chalk

16 There is no detailed soil survey map for the area, but the reconnaissance soil map (SSEW 1983) shows the area to comprise soils of the Batcombe association These soils 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)

Agricultural Land Classification

17 The details of the classification of the site are shown on the attached ALC map and the area statistics of each grade are given in Table 1 page 1

18 The location of the auger borings and pits is shown on the attached sample location map and the details of the soils data are presented in Appendix III

Grade 2

19 Grade 2 very good quality agricultural land has been mapped on the eastern side of the site where deep fine silty over clayey soils overlying chalk were identified This land is subject to a minor soil droughtiness limitation These soils generally have a medium silty clay loam topsoil overlying a medium silty clay loam upper subsoil which becomes silty clay or clay with depth, with few manganese concretions These subsoils are moderately structured Weathered chalk is typically encountered below 70 cm depth and the soils are assessed as Wetness Class I (see Appendix II) These soils have a moderately high available water capacity and under the prevailing climatic conditions are likely to be slightly droughty for deeper rooting crops in most years such that Grade 2 is appropriate

Subgrade 3a

20 Subgrade 3a, good quality agricultural land has been mapped on the western side of the site where the underlying chalk was encountered at shallower depths This land is also subject to a soil droughtiness limitation Soils in this area typically have a medium silty clay loam topsoil overlying a well structured brown clay or silty clay subsoil Fissured chalk was generally encountered within 40-50 cm depth with plant roots exploiting the chalk to approximately 85 cm depth The combination of restricted rooting depth and chalk lower subsoils at a locality where the climate is relatively dry causes the profile available water to be somewhat restricted as indicated by moisture balance calculations for the soils on the site Soil droughtiness may cause crops to experience drought stress and thereby affect the versatility of the land in terms of the yield potential of crops which are grown

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SOURCES OF REFERENCE

British Geological Survey (1977) *Sheet No* 272 *Chatham*
BGS London

Ministry of Agriculture Fisheries and Food (1988) *Agricultural Land Classification of England and Wales Revised guidelines and criteria for grading the quality of agricultural land*
MAFF London

Met Office (1989) *Climatological Data for Agricultural Land Classification*
Met Office Bracknell

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

Soil Survey of England and Wales (1984) *Soils and their Use in South East England*
SSEW Harpenden

APPENDIX I

DESCRIPTIONS 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

APPENDIX II

SOIL WETNESS CLASSIFICATION

Definitions of Soil Wetness Classes

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

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

Assessment of Wetness Class

Soils have been allocated to wetness classes by the interpretation of soil profile characteristics and climatic factors using the methodology described in *Agricultural Land Classification of England and Wales Revised guidelines and criteria for grading the quality of agricultural land* (MAFF 1988)

[1] The number of days is not necessarily a continuous period
[2] In most years is defined as more than 10 out of 20 years

APPENDIX III

SOIL DATA

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 sandston	**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 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 SWALE BLP SITT 6 Pit Number 1P

Grid Reference TQ89006160 Average Annual Rainfall 695 mm
Accumulated Temperature 1425 degree days
Field Capacity Level 140 days
Land Use Permanent Grass
Slope and Aspect degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 27	MZCL	75YR43 00	2	3	HR					
27- 42	C	75YR46 44	0	4	HR		MDCSAB	FM	M	
42- 85	CH	10YR81 00	0	5	HR				P	Y

Wetness Grade 1 Wetness Class I
Gleying cm
SPL No SPL

Drought Grade 3A APW 104mm MBW -6 mm
APP 100mm MBP -3 mm

FINAL ALC GRADE 3A
MAIN LIMITATION Droughtiness

SAMPLE NO	GRID REF	USE	ASPECT		--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1	TQ89006170	PGR			1	1	103	-7	98	-5	3A				DR	3A	Chalk 40
1P	TQ89006160	PGR			1	1	104	-6	100	-3	3A				DR	3A	Chalk 42
2	TQ89106170	PGR			1	1	145	35	118	15	1					1	No chalk
3	TQ89006160	PGR			1	1	105	-5	100	-3	3A				DR	3A	Chalk 45
4	TQ89106160	PGR			1	1	146	36	121	18	1					1	Chalky 65
5	TQ89106150	PGR			1	1	135	25	130	27	2				DR	2	Chalk 75
6	TQ88906179	PGR			1	1	104	-6	100	-3	3A				DR	3A	Chalk 45

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	0-27	mzcl	10YR43 00						3	0	HR	4						
	27-40	c	75YR45 00						0	0	HR	2		M				
	40-85	ch	10YR81 00						0	0	HR	5		P				Y
1P	0-27	mzcl	75YR43 00						2	0	HR	3						
	27-42	c	75YR46 44						0	0	HR	4	MDCSAB FM	M				
	42-85	ch	10YR81 00						0	0	HR	5		P				Y
2	0-30	mcl	10YR44 00						5	0	HR	5						
	30-80	hzcl	10YR56 00						0	0	HR	2		M				
	80-120	c	75YR46 00	00MN00	00	C			0	0	HR	3		M				
3	0-25	mzcl	75YR43 00						1	0	HR	2						
	25-45	zc	75YR45 00	00MN00	00	F			0	0		0		M				
	45-85	ch	10YR81 00						0	0	HR	5		P				Y
4	0-30	mzcl	10YR44 00						3	0	HR	3						
	30-40	mzcl	10YR46 00						0	0	HR	3		M				
	40-65	hzcl	10YR46 00	00MN00	00	F			0	0	HR	2		M				
	65-120	zc	10YR56 00						0	0	CH	20		M				Y
5	0-30	fszl	10YR44 00						2	0	HR	2						
	30-55	mzcl	10YR46 00						0	0	HR	2		M				
	55-75	c	10YR56 00	75YR58	00	F			0	0	HR	2		M				
	75-100	ch	10YR81 00						0	0	HR	5		P				Y
6	0-28	mzcl	75YR43 00						3	0	HR	4						
	28-45	zc	75YR45 00						0	0	HR	2		M				
	45-85	ch	10YR81 00						0	0	HR	5		P				Y