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Swale Borough Local Plan
Objector Site Sitt 17,
Land NE of Stickfast Farm,
Howt Green, 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 17,
LAND NORTH EAST OF STICKFAST FARM, HOWT GREEN, SITTINGBOURNE

Introduction

1 This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 11 ha of land to the north east of Stickfast Farm Howt Green, which is located to the north eastern 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 had been sown to winter wheat

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	11 1	100 0	100 0
Total surveyed area	11 1		100 0
Total site area	11 1	100 0	

7 The fieldwork was conducted at an average density of 1 boring per hectare A total of 11 borings were described which were backed up by data from one soil inspection pit

8 The whole site has been mapped as Grade 2 very good quality agricultural land with the land to the south and west having a minor wetness limitation and some profiles on the site also having a minor droughtiness restriction The soils comprise deep silty and fine silty brickearth deposits although in the south west corner the soils are clayey at depth On the eastern side of the site the land is slightly lower indicating that brickearth has been extracted in the past Moisture balance calculations indicate that in this low rainfall area several profiles are slightly droughty restricting the land quality to Grade 2 It should however be indicated that some soil profiles on the site are of Grade 1 potential although it is not possible to delineate these areas at this scale of mapping

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 896 663
Altitude	m AOD	25
Accumulated Temperature	day°C (Jan June)	1471
Average Annual Rainfall	mm	600
Field Capacity Days	days	118
Moisture Deficit, Wheat	mm	121
Moisture Deficit, Potatoes	mm	118

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 accumulated temperature at this site mean that the area is relatively dry and warm Climatic factors do interact with soil properties to influence soil wetness and droughtiness limitations The crop adjusted soil moisture deficits at this locality are above the average for the south east of England This increases the likelihood of soil droughtiness limitations No local climatic factors such as exposure and frost risk, are believed to adversely affect the land quality on the site This site is climatically Grade 1

Site

14 The site lies at an altitude of approximately 25 m AOD and falls gently toward the east Indications are that the eastern side of the site has been worked for brickearth in the past leaving the land at a slightly lower level Nowhere on the site however 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 1974) shows the majority of the area to be underlain by head brickearth with a small intrusion of London Clay into the south-west corner of the site

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 Park Gate association These soils are described as Deep stoneless silty soils variably affected by groundwater ' (SSEW, 1983) The soils have grey and ochreous mottled subsoil colours indicating seasonal waterlogging The large silt content of the soils makes them liable to cap and pan where they are under long term cultivation and organic matter contents are small

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

Subgrade 2

19 The whole site has been mapped as Grade 2 land very good quality, with the land to the south and west having a minor wetness limitation and some profiles on the site also having a minor droughtiness restriction The soils comprise deep silty and fine silty brickearth deposits although in the south-west corner the soils are clayey at depth On the eastern side of the site the land is slightly lower indicating that brickearth has been extracted in the past

20 Typical soil profiles on the site have a silt loam topsoil overlying a medium silty clay loam upper subsoil which on the western side of the site has common ochreous mottles The soils typically become mottled heavy silty clay loam with depth The soils are porous and stoneless throughout and are mainly assessed as Wetness Class I (see Appendix II) On the western side of the site the presence of mottling at shallow depths within the soil profile means that these profiles are assigned to Wetness Class II In the area where brickearth has been extracted in the past, the lower subsoil is typically heavy clay loam or clay The interaction between these soil characteristics and the prevailing climate (which is very dry in a regional context) slightly reduces the amount of profile available water for plants This is likely to have the effect of restricting the level and consistency of crop yields to the extent that Grade 2 is appropriate On the western side of the site, the land is also subject to slight restrictions on the flexibility of cropping, stocking and cultivations It should be noted that some profiles have no wetness or droughtiness limitations and qualify for Grade 1 However, it is not possible to delineate these areas at this scale of mapping

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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 LP SITT 17 Pit Number 1P

Grid Reference TQ89606610 Average Annual Rainfall 600 mm
Accumulated Temperature 1471 degree days
Field Capacity Level 118 days
Land Use Cereals
Slope and Aspect 01 degrees SE

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 33	ZL	10YR43 00	0	0						
33- 45	MZCL	10YR64 00	0	0		F	MDCSAB	FM	M	
45-120	HZCL	75YR64 00	0	0		C	STCPR	FM	P	

Wetness Grade 1 Wetness Class I
Gleying 045 cm
SPL No SPL

Drought Grade 2 APW 144mm MBW 23 mm
APP 126mm MBP 8 mm

FINAL ALC GRADE 2
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	TQ89506630	CER	NE	02	030		2	2	154	33	130	12	1				WE	2	
1P	TQ89606610	CER	SE	01	045		1	1	144	23	126	8	2				DR	2	Slightly wet
2	TQ89606630	CER	NE	01			1	1	162	41	135	17	1					1	Worked
3	TQ89706630	CER	NE	01			1	1	148	27	125	7	2				DR	2	Worked
4	TQ89506620	CER	SE	01			1	1	141	20	109	-9	2				DR	2	Sl gleyed 35
5	TQ89606620	CER	SE	01	035		2	2	145	24	109	-9	2				WD	2	
6	TQ89706620	CER	NE	01			1	1	158	37	136	18	1					1	
7	TQ89806620	CER	NE	01			1	1	176	55	140	22	1					1	
8	TQ89506610	CER	SE	01			1	1	152	31	135	17	1					1	Sl gleyed 60
9	TQ89606610	CER	SE	01	050		1	1	159	38	131	13	1					1	
10	TQ89706610	CER	SE	01			1	1	135	14	118	0	2				DR	2	Sl gleyed 55
11	TQ89606600	CER	SE	01	050	050	2	2	137	16	115	-3	2				WD	2	

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	zl	10YR44 00						0	0		0							
	30-55	mzcl	10YR53 00	75YR56 00	C			Y	0	0		0		M					
	55-120	hcl	10YR56 00	00MN00 00	F				0	0		0		P			Y		
1P	0-33	zl	10YR43 00						0	0		0							
	33-45	mzcl	10YR64 00	10YR66 00	F				0	0		0	MDCSAB	FM M					
	45-120	hzcl	75YR64 00	10YR68 00	C			Y	0	0		0	STCPR	FM P					
2	0-30	zl	10YR44 00						0	0		0							
	30-55	mzcl	10YR54 00						0	0		0		M					
	55-85	hcl	75YR55 00	00MN00 00	C				0	0	HR	1		M			Y		
	85-120	hcl	10YR65 00	00MN00 00	C				0	0		0		P					
3	0-30	zl	10YR44 00						0	0		0							
	30-40	mzcl	10YR54 00						0	0		0		M					
	40-120	c	10YR56 00	00MN00 00	F				0	0		0		P			Y		
4	0-35	mzcl	10YR44 00						0	0		0							
	35-85	hzcl	75YR54 00	75YR56 00	C			S	0	0		0		P					
	85-120	mzcl	10YR64 00	10YR66 00	F				0	0		0		M			Y	Sl	gleyed
5	0-35	mzcl	10YR43 00						0	0		0							
	35-75	hzcl	10YR64 54	75YR56 00	C			Y	0	0		0		P					
	75-120	mzcl	10YR55 00	10YR66 00	F				0	0		0		M			Y		
6	0-35	zl	10YR43 00						0	0		0							
	35-60	hzcl	10YR65 00						0	0		0		M			Y		
	60-120	c	10YR54 00	10YR56 00	F				0	0		0		P			Y		
7	0-35	zl	10YR44 00						0	0		0							
	35-50	mzcl	75YR54 00						0	0		0		M					
	50-120	hzcl	10YR55 00	75YR56 00	F				0	0		0		M					
8	0-35	zl	10YR43 00						0	0		0							
	35-60	mzcl	75YR55 00	75YR56 00	F				0	0		0		M					
	60-120	hzcl	75YR55 00	75YR56 00	C			S	0	0		0		P				Sl	gleyed
9	0-37	zl	10YR43 00						0	0		0							
	37-50	mzcl	10YR64 00	10YR66 00	F				0	0		0		M					
	50-95	hzcl	10YR64 00	10YR68 00	C			Y	0	0		0		P			Y		
	95-120	mzcl	10YR64 00	10YR66 00	C			Y	0	0		0		M			Y		
10	0-35	mzcl	10YR43 00						0	0	HR	1							
	35-55	mzcl	10YR55 00						0	0		0		M					
	55-120	hzcl	75YR54 00	75YR56 00	C			S	0	0		0		P				Sl	gleyed
11	0-35	mzcl	10YR33 00						2	0	HR	2							
	35-50	hzcl	10YR54 00						0	0	HR	2		M					
	50-120	c	25Y 53 54	10YR58 00	M			Y	0	0	HR	4		P		Y			