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Swale Borough Local Plan
Objector Site Sitt 10,
Land at Bapchild,
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 10, LAND AT BAPCHILD, SITTINGBOURNE

Introduction

1 This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 5 ha of land on the southern side of the village of Bapchild to the east 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 southern part of the site was under cherry orchard whilst to the north the land was in arable use with runner beans growing adjacent to the orchard and the land to the north of the farm track having been recently cultivated. The eastern part of the site is principally occupied by farm buildings and a house and garden.

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
1	4.2	82.4	100.0
Other land	0.9	17.6	
Total surveyed area	4.2		100.0
Total site area	5.1	100.0	

7 The fieldwork was conducted at an average density of 1 boring per hectare. A total of 5 borings were described which were backed up by data from one soil inspection pit.

8 All of the agricultural land on the site has been mapped as Grade 1 excellent quality land. The soils comprise deep free draining easily worked silty over fine silty brickearth deposits. Such soils have large reservoirs of available moisture and despite the relatively high moisture deficits that are prevalent in the area they will not be particularly susceptible to drought. Such soils therefore have minor or no limitation to agricultural use and are therefore included within Grade 1. The area of residential and farm buildings on the eastern side of the site has been mapped as Other land.

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 928 627
Altitude	m AOD	22
Accumulated Temperature	day°C (Jan June)	1475
Average Annual Rainfall	mm	642
Field Capacity Days	days	127
Moisture Deficit Wheat	mm	117
Moisture Deficit Potatoes	mm	113

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 (AT0 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 high available water capacity to avoid droughtiness limitations. There is however no overall climatic limitation in this area.

Site

14 The altitude of the site ranges from 25 m AOD on the southern boundary to approximately 19 m AOD in the north. Gradients on the site are relatively gentle typically 1 to 2°. 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 majority of the site to be underlain by drift deposits of head brickearth with some Thanet Beds sands occupying the western fringe 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 Hamble 1 association. These soils are described as Deep well drained often stoneless fine silty soils. Some similar soils affected by groundwater and some fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging. Some shallower soils over chalk. Slight risk of water erosion. (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 1

19 All the agricultural land on the site has been mapped as Grade 1 excellent quality land. The soils on the site comprise deep free draining silty deposits and a typical profile has a brown silt loam topsoil overlying a yellowish brown silt loam upper subsoil. Below 40-60 cm depth the texture becomes a medium silty clay loam or occasionally heavy silty clay loam. The soils generally have a few small flint stones throughout. As shown by Pit 1 which represents such profiles upper subsoils are moderately structured and lower subsoils poorly structured. These soils are permeable with common coarse pores and are assessed as Wetness Class I (see Appendix II). Due to the silty nature of the soils available water capacities are high and moisture balance calculations indicate that the soils contain sufficient water to avoid drought stress during the growing season. Consequently the land has been included within Grade 1.

N A Duncan
for the Resource Planning Team
Guildford Statutory Group
ADAS Reading

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

Sample location map

Soil abbreviations Explanatory Note

Soil Pit Descriptions

Soil boring descriptions (boring and horizon levels)

Database Printout - Horizon Level Information

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 **GLEYS/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 dolomitic 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 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 SITT10 BAPCHID Pit Number 1P

Grid Reference TQ92706280 Average Annual Rainfall 644 mm
 Accumulated Temperature 1471 degree days
 Field Capacity Level 128 days
 Land Use Ploughed
 Slope and Aspect 01 degrees NE

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 30	ZL	10YR44 00	1	2	HR					
30- 40	ZL	10YR54 00	0	1	HR		MDMSAB	FR	M	
40- 70	MZCL	10YR54 00	0	1	HR		MDCSAB	FM	M	
70-120	HZCL	10YR54 64	0	1	HR		STCPR	FM	P	

Wetness Grade 1 Wetness Class I
 Gleying cm
 SPL No SPL

Drought Grade 1 APW 156mm MBW 39 mm
 APP 140mm MBP 27 mm

FINAL ALC GRADE 1
 MAIN LIMITATION

SAMPLE NO	GRID REF	ASPECT USE	GRDNT	--WETNESS--		-WHEAT-		-POTS-		M REL		EROSN	FROST	CHEM	ALC	COMMENTS
				CLASS	GRADE	AP	MB	AP	MB	ORT	FLOOD	EXP	DIST	LIMIT		
1	TQ92706280	PLO NE	02	1	1	162	45	144	31	1					1	
1P	TQ92706280	PLO NE	01	1	1	156	39	140	27	1					1	
2	TQ92806280	PLO NE	01	1	1	181	64	145	32	1					1	
3	TQ92706270	FRT NE	02	1	1	185	68	150	37	1					1	
4	TQ92806272	PLO NE	01	1	1	141	24	121	8	2					2	DR
5	TQ92806260	FRT E	02	1	1	152	35	137	24	1					1	

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----			PED COL	----STONES----			STRUCT/ CONSIST	SUBS					
				COL	ABUN	CONT		GLY	>2	>6		LITH	TOT	STR	POR	IMP	SPL
1	0-30	z1	10YR44 00					0	0	HR	1						
	30-45	z1	10YR54 00					0	0	HR	1		M				
	45-75	hzc1	10YR54 00					0	0		0		M				
	75-120	hzc1	25Y 54 00					0	0		0		P				
1P	0-30	z1	10YR44 00					1	0	HR	2						
	30-40	z1	10YR54 00					0	0	HR	1	MDMSAB	FR	M			
	40-70	mzc1	10YR54 00					0	0	HR	1	MDCSAB	FM	M			
	70-120	hzc1	10YR54 64					0	0	HR	1	STCPR	FM	P			
2	0-30	z1	10YR44 00					0	0	HR	2						
	30-50	z1	10YR54 00					0	0	HR	1		M				
	50-120	mzc1	10YR54 00					0	0	HR	1		M				
3	0-35	z1	10YR34 00					1	0	HR	2						
	35-60	z1	10YR44 00					0	0	HR	1		M				
	60-120	mzc1	10YR54 00					0	0	HR	1		M				
4	0-30	mzc1	10YR43 00					1	0	HR	2						
	30-65	hzc1	10YR54 00	00M00	00	F		0	0	HR	1		M				
	65-120	c	75YR45 00	00M00	00	C		0	0	HR	5		P				
5	0-27	z1	10YR34 00					1	0	HR	2						
	27-40	z1	10YR54 00					0	0	HR	2		M				
	40-65	mzc1	10YR54 00					0	0	HR	2		M				
	65-120	hzc1	10YR56 00					0	0	HR	3		P				