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Swale Borough Local Plan
Objector Site Sitt 1
Land at Pinks Corner,
South East of Iwade

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 1, LAND AT PINKS CORNER, SOUTH EAST OF IWADE

Introduction

1 This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 7.2 ha of land at Pinks Corner to the south east of the village of Iwade. 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 majority of the site was in permanent grass with a house and garden (Pond Farm) on the northern side of the site and a farm shop and associated house and farm buildings on the southern side.

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	1.6	22.2	29.6
3a	3.8	52.8	70.4
Other land	1.8	25.0	
Total surveyed area	5.4		100.0
Total site area	7.2	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 2 soil inspection pits

8 The western part of the site has been classified as Grade 2 very good quality agricultural land and comprises soils developed in brickearth. Due to the high moisture deficits that prevail in this area and the presence of silty clay loam textures throughout these soils are slightly droughty and are restricted to Grade 2. The eastern half of the site however has soils developed on London Clay. These soils have slowly permeable subsoils and are limited to Subgrade 3a good quality agricultural land due to a moderate wetness and workability limitation. Two areas of Other Land have been identified which are occupied by residential and farm buildings

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 902 670
Altitude	m AOD	15
Accumulated Temperature	day°C (Jan June)	1482
Average Annual Rainfall	mm	584
Field Capacity Days	days	114
Moisture Deficit, Wheat	mm	124
Moisture Deficit Potatoes	mm	122

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

Site

14 The site lies at an altitude of approximately 15 m AOD and is relatively flat. Nowhere on the site does gradient or micro-relief affect the agricultural land quality on the site.

Geology and soils

15 The published geological information for the area (BGS 1977) shows the entire site to be underlain by London Clay which is overlain by head brickearth deposits on the western side 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.

Grade 2

19 The land on the western side of the site has been mapped as Grade 2 very good quality agricultural land because of a minor soil droughtiness limitation. The soils in this area are developed in brickearth. Topsoils typically comprise non-calcareous medium silty clay loams and occasionally silt loams. These overlie non-calcareous brown permeable medium and heavy silty clay loam upper subsoils. Below approximately 50 cm depth these pass into similarly textured calcareous and non-calcareous lower subsoils which have faint ochreous mottling. Both upper and lower subsoils are moderately structured. These profiles are stoneless permeable and are assessed as Wetness Class I (see Appendix II). Moisture balance calculations indicate that in this low rainfall area these soils will be slightly droughty for the shallower rooting crops such as potatoes restricting the land quality to Grade 2.

Subgrade 3a

20 Good quality agricultural land Subgrade 3a has been mapped on the eastern side of the site This land is subject to moderate soil wetness and workability limitations which often act in conjunction with soil droughtiness limitations Topsoils comprise non-calcareous medium silty clay loams In some profiles these pass into gleyed heavy silty clay loam or heavy clay loam upper subsoils which are moderately structured and permeable These pass into poorly structured and slowly permeable clay lower subsoils at approximately 50 cm depth In the remaining profiles the permeable upper subsoil is absent and the slowly permeable clays occur directly below the topsoil The dry prevailing climate means that all of the profiles within this mapping unit are assessed as imperfectly drained and so have been assigned to Wetness Class III The interaction between the soil drainage characteristics and medium textured topsoils with the local climatic regime means that Subgrade 3a is appropriate This land will be subject to some restrictions on the flexibility of cropping stocking and cultivations

21 The dry prevailing climate means that parts of this land are also subject to a moderate soil droughtiness limitation Such land occurs where the poorly structured clays occur directly below the topsoil The water storage capacity of soil is strongly influenced by texture structure organic matter content and stone content In comparison to other combinations poorly structured clays hold only small reserves of moisture available to plant roots The interaction between these soil characteristics and the dry prevailing climate causes the profile available water to be slightly restricted as indicated by moisture balance calculations for the soils on the site Hence the soils will be moderately droughty especially for shallower rooting crops such as potatoes and Subgrade 3a is appropriate

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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

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 **GLEYSPL** 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 **GLEYS** 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 **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 1 IWADE Pit Number 1P

Grid Reference TQ90206700 Average Annual Rainfall 584 mm
 Accumulated Temperature 1482 degree days
 Field Capacity Level 114 days
 Land Use Permanent Grass
 Slope and Aspect degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 25	MZCL	10YR34 00	0	0						
25- 40	C	25Y 53 00	0	0		C	MDCPR	FM	P	
40-120	C	25Y 63 00	0	0		C	STCPR	FM	P	

Wetness Grade 3A Wetness Class III
 Gleying 025 cm
 SPL 025 cm

Drought Grade 3A APW 129mm MBW 5 mm
 APP 106mm MBP -16 mm

FINAL ALC GRADE 3A

MAIN LIMITATION Soil Wetness/Droughtiness

SOIL PIT DESCRIPTION

Site Name SWALE LP SITT 1 IWADE Pit Number 2P

Grid Reference TQ90106703 Average Annual Rainfall 584 mm
 Accumulated Temperature 1482 degree days
 Field Capacity Level 114 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	10YR43 00	0	0						
27- 50	MZCL	10YR55 00	0	0			MDCSAB	FR	M	
50- 75	HZCL	10YR54 00	0	0		C	MDMPR	FM	M	
75-120	MZCL	10YR64 00	0	0		C	WKCSAB	FR	M	Y

Wetness Grade 1 Wetness Class I
 Gleying 075 cm
 SPL No SPL

Drought Grade 2 APW 160mm MBW 36 mm
 APP 124mm MBP 2 mm

FINAL ALC GRADE 2
 MAIN LIMITATION Droughtiness

SAMPLE NO	GRID REF	ASPECT USE	--WETNESS--		-WHEAT-		-POTS-		M REL		EROSN	FROST	CHEM	ALC	COMMENTS
			GRDNT	GLEYSPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	
1	TQ90106710	PGR	055		1	1	161	37	125	3	2			DR	2
1P	TQ90206700	PGR	025	025	3	3A	129	5	106	-16	3A			WD	3A
2	TQ90246708	PGR	030	050	3	3A	140	16	117	-5	2			WE	3A
2P	TQ90106703	PGR	075		1	1	160	36	124	2	2			DR	2
3	TQ90106703	PGR	050		1	1	171	47	135	13	1				1
4	TQ90206700	PGR	025	025	3	3A	129	5	106	-16	3A			WD	3A
6	TQ90206690	PGR	028	050	3	3A	93	-31	102	-20	3B			WD	3A Imp65 Q 3a dr

SAMPLE	DEPTH	TEXTURE	COLOUR	---MOTTLES---			PED COL	---STONES---			STRUCT/ CONSIST	SUBS					
				COL	ABUN	CONT		GLE	>2	>6		LITH	TOT	STR	POR	IMP	SPL
1	0-30	mzc1	10YR43 00					0	0	0							
	30-55	hzc1	10YR55 00	00M	00	00	F	0	0	0		M					
	55-80	hzc1	10YR53 00	75YR56	00	00	C	Y	0	0	0		M				Y
	80-120	mzc1	10YR64 00					0	0	0			M				Y
1P	0-25	mzc1	10YR34 00					0	0	0							
	25-40	c	25Y 53 00	10YR56	00	00	C	Y	0	0	0	MDCPR	FM	P	Y		Y
	40-120	c	25Y 63 00	10YR56	00	00	C	Y	0	0	0	STCPR	FM	P	Y		Y
2	0-30	mzc1	10YR43 00	10YR46	00	00	F	0	0	0							
	30-50	hzc1	25Y 53 00	10YR66	00	00	C	Y	0	0	0			M			
	50-90	c	25Y 63 00	10YR66	00	00	C	Y	0	0	0			P			Y
	90-120	c	05Y 63 00	25Y 56	00	00	C	Y	0	0	0			P			Y
2P	0-27	mzc1	10YR43 00					0	0	0							
	27-50	mzc1	10YR55 00					0	0	0	MDCSAB	FR	M				c 1% pores
	50-75	hzc1	10YR54 00	75YR56	00	00	C	S	0	0	0	MDMPR	FM	M			c 1% pores
	75-120	mzc1	10YR64 00	10YR56	00	00	C	Y	0	0	0	WKCSAB	FR	M			Y
3	0-27	z1	10YR43 00					0	0	0							
	27-50	mzc1	10YR54 00	00M	00	00	F	0	0	0			M				
	50-120	hzc1	10YR64 00	75YR56	00	00	C	Y	0	0	0			M			
4	0-25	mzc1	10YR34 00					0	0	HR	1						
	25-120	c	25Y 53 00	10YR56	00	00	C	Y	0	0	0			P			
6	0-28	mc1	10YR43 00					0	0	HR	2						
	28-50	hc1	25Y 53 00	10YR56	00	00	C	Y	0	0	HR	5			M		
	50-65	c	25Y 53 00	10YR56	00	00	C	Y	0	0	HR	5			P		Y