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Swale Borough Local Plan
Objector Site Sitt 16,
Land at Sheppey Way,
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 16, LAND AT SHEPPEY WAY, HOWT GREEN, SITTINGBOURNE

Introduction

1 This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 14 ha of land on the north eastern side of Sheppey Way at Howt Green, to the north 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 majority of the site was in permanent grass and being grazed by sheep. A small area of cereal stubble is also included to the north east of the site.

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
3a	6.3	44.7	44.7
3b	7.8	55.3	55.3
Total surveyed area	14.1		100.0
Total site area	14.1	100.0	

7 The fieldwork was conducted at an average density of 1 boring per hectare. A total of 14 borings were described which were backed up by data from one soil inspection pit.

8 The north eastern part of the site has been mapped as Subgrade 3a good quality agricultural land whilst to the west the land is classified as Subgrade 3b moderate quality agricultural land. The whole area is underlain by London Clay giving rise to fine loamy over clayey soils which due to the presence of slowly permeable clayey subsoils results in a wetness limitation. On the western side of the site slowly permeable clay is found immediately below the topsoil whilst to the east it is deeper. The wetness and workability limitation on the western part of the site therefore is moderately severe restricting the land to Subgrade 3b whilst to the north and east it is less pronounced resulting in a Subgrade 3a 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 892 662
Altitude	m AOD	30
Accumulated Temperature	day°C (Jan June)	1465
Average Annual Rainfall	mm	604
Field Capacity Days	days	119
Moisture Deficit Wheat	mm	120
Moisture Deficit Potatoes	mm	117

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 site lies at an altitude of approximately 30 m AOD and falls gently toward the north and east. 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 all of the site to be underlain by London Clay. Drift deposits of head brickearth are mapped to the north and east of the area.

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 with a very small area of Essendon association in the south west corner. Soils of the Park Gate association are described as Deep stoneless silty soils variably affected by groundwater (SSEW 1983). Soils of the Essendon association are described as Slowly permeable seasonally waterlogged coarse loamy over clayey soils. Associated with similar fine loamy over clayey and fine silty over clayey soils (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.

Subgrade 3a

19 The eastern side of the site has been mapped as Subgrade 3a good quality agricultural land because of a soil wetness and workability limitation. Profiles typically comprise fine loamy over clayey soils with slowly permeable subsoils. Two of the profiles mapped on the eastern fringe of the site however have higher silt contents reflecting the presence of brickearth material within this area (as delineated on the published geology map).

20 A typical soil profile within this mapping unit has a dark brown non calcareous heavy clay loam topsoil overlying a yellowish brown heavy clay loam upper subsoil with some upper subsoils being slightly gleyed. As shown by Pit 1 which represents such profiles the upper subsoils are permeable and moderately structured. These profiles pass into lower subsoils at approximately 45 cm depth. The lower subsoils comprise grey clays which are gleyed slowly permeable and poorly structured. These soils are moderately well drained and have been assessed as Wetness Class II (see Appendix II). Despite the low rainfall of the area the heavy textured topsoils means that these soils will have a workability limitation during the wetter periods of the year which restricts the land quality to Subgrade 3a.

Subgrade 3b

20 Land on the western side of the site has been classified as Subgrade 3b moderate quality agricultural land because of significant soil wetness and workability limitations. The soils in this area are similar to those described in paragraph 20 but with slowly permeable clay subsoils immediately below the topsoil. The dry prevailing climate means that these soils are imperfectly drained and have been assigned to Wetness Class III. The shallow depth to the slowly permeable horizon and heavy topsoil textures result in a more pronounced wetness and workability limitation which imposes significant restrictions on cultivations and grazing by livestock. Consequently Subgrade 3b 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)

SOIL PIT DESCRIPTION

Site Name SWALE LP SITT 16 Pit Number 1P

Grid Reference TQ89406590
 Average Annual Rainfall 604 mm
 Accumulated Temperature 1465 degree days
 Field Capacity Level 119 days
 Land Use Permanent Grass
 Slope and Aspect 01 degrees E

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 27	HCL	10YR43 00	1	2	HR					
27- 45	HCL	10YR54 00	0	3	HR	C	MDCSAB	FM	M	
45-120	C	25Y 63 72	0	0		M	STCPR	FM	P	

Wetness Grade 3A
 Wetness Class II
 Gleying 045 cm
 SPL 045 cm

Drought Grade 2
 APW 131mm MBW 11 mm
 APP 108mm MBP -8 mm

FINAL ALC GRADE 3A
 MAIN LIMITATION Wetness

SAMPLE NO	GRID REF	USE	ASPECT	--WETNESS--		-WHEAT-		-POTS-		M REL		EROSN	FROST	CHEM	ALC	COMMENTS
				GRDNT	GLEY	SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	
1	TQ89106620	PGR	NW	02	045	045	2	3A	133	13	108	-8	2			WE 3A
1P	TQ89406590	PGR	E	01	045	045	2	3A	131	11	108	-8	2			WE 3A
2	TQ89206620	CER	NW	02	050	080	2	2	149	29	125	9	2			WD 2
3	TQ89006610	PGR	NW	03	028	045	3	3B	132	12	109	-7	2			WE 3B
4	TQ89106610	PGR	NW	02	025	045	3	3B	130	10	107	-9	2			WE 3B
5	TQ89206610	PGR	NW	01	024	024	3	3B	128	8	105	-11	3A			WE 3B
6	TQ89006600	PGR	NW	02	027	045	3	3B	130	10	107	-9	2			WE 3B
7	TQ89106600	PGR	NW	01	025	025	3	3B	126	6	103	-13	3A			WE 3B
8	TQ89206600	PGR	E	01	045	045	2	3A	135	15	112	-4	2			WE 3A
9	TQ89306600	CER			050	050	2	3A	135	15	112	-4	2			WE 3A
10	TQ89206590	PGR	E	01	045	045	2	3A	135	15	112	-4	2			WE 3A
11	TQ89306590	PGR	E	01	047	047	2	3A	133	13	110	-6	2			WE 3A
12	TQ89406590	PGR	E	01	045	045	2	3A	133	13	110	-6	2			WE 3A
13	TQ89206580	PGR	S	02	025	025	3	3B	129	9	106	-10	2			WE 3B
14	TQ89306580	PGR	SE	02	025	025	3	3B	126	6	103	-13	3A			WE 3B

SAMPLE	DEPTH	TEXTURE	COLOUR	---MOTTLES---			PED COL	---STONES---			STRUCT/ CONSIST	SUBS			CALC
				COL	ABUN	CONT		GLE	>2	>6		LITH	TOT	STR	
1	0-28	hc1	10YR43 00					1	0	HR	2				
	28-45	hzc1	25Y 54 00 10YR66 00 F					0	0	HR	2	M			
	45-70	zc	25Y 63 00 10YR68 00 C					Y	0	0	0	P		Y	
	70-120	c	05Y 62 00 10YR68 00 M					Y	0	0	0	P		Y	
1P	0-27	hc1	10YR43 00					1	0	HR	2				
	27-45	hc1	10YR54 00 10YR56 00 C					S	0	0	HR	3	MDCSAB FM M	S1 gleyed	
	45-120	c	25Y 63 72 10YR68 00 M				05Y 72 00	Y	0	0	0	STCPR FM P		Y	
2	0-30	mzc1	10YR43 00					0	0		0				
	30-50	mzc1	10YR54 00 75YR56 00 F					0	0		0	M			
	50-80	hzc1	10YR64 00 75YR56 00 C					Y	0	0	0	M			
	80-120	zc	10YR64 00 75YR58 00 C					Y	0	0	0	P		Y	
3	0-28	hc1	10YR43 00					1	0	HR	2				
	28-45	c	25Y 53 54 10YR66 00 C					Y	0	0	HR	1	M	Y Q sp1	
	45-120	c	05Y 62 63 10YR56 58 C					Y	0	0	0	P		Y	
4	0-25	hc1	10YR43 00					2	0	HR	3				
	25-45	c	10YR53 00 10YR58 00 C					S	0	0	HR	5	M		
	45-75	c	25Y 63 64 10YR68 00 M					Y	0	0	0	P		Y	
	75-120	c	05Y 62 00 25Y 56 00 C					Y	0	0	0	P		Y	
5	0-24	hzc1	25Y 43 00 10YR46 00 C					1	0	HR	2				
	24-55	c	25Y 63 00 10YR68 00 M					Y	0	0	0	P		Y	
	55-120	c	25Y 63 00 10YR58 00 C					Y	0	0	0	P		Y	
6	0-27	hc1	10YR43 00					4	0	HR	4				
	27-45	c	25Y 53 00 10YR58 00 C					Y	0	0	HR	4	M		
	45-120	c	05Y 63 00 10YR68 00 M					Y	0	0	0	P		Y	
7	0-25	hzc1	10YR42 00 10YR46 00 C					0	0	HR	1				
	25-55	c	25Y 62 00 75YR56 00 C					Y	0	0	HR	8	P	Y	
	55-120	c	05Y 63 00 10YR66 00 C					Y	0	0	0	P		Y	
8	0-27	hzc1	10YR43 00 10YR46 00 F					0	0		0				
	27-45	c	10YR54 00					0	0	CH	2	M		Y	
	45-80	c	25Y 63 00 10YR58 00 C					Y	0	0	0	P		Y Y	
	80-120	c	05Y 62 63 25Y 56 00 C					Y	0	0	0	P		Y	
9	0-30	hzc1	25Y 43 00					0	0	HR	1				
	30-50	zc	25Y 64 00 25Y 56 00 F					0	0		0	M			
	50-120	c	05Y 63 00 25Y 56 00 C					Y	0	0	0	P		Y	
10	0-28	hzc1	10YR43 00					1	0	HR	2				
	28-45	c	10YR54 00 10YR56 00 F					0	0	CH	1	M			
	45-120	c	25Y 63 00 10YR58 00 M					Y	0	0	0	P		Y	

SAMPLE	DEPTH	TEXTURE	COLOUR	---MOTTLES---			PED COL	---STONES---			STRUCT/ CONSIST	SUBS					
				COL	ABUN	CONT		GLEY	>2	>6		LITH	TOT	STR	POR	IMP	SPL
11	0-28	hc1	10YR43 00					1	0	HR	2						
	28-47	hc1	10YR55 00 75YR56 00 F					0	0		0		M				
	47-120	c	05Y 63 00 10YR68 00 C					Y	0	0	0		P			Y	
12	0-28	hc1	10YR43 00					1	0	HR	1						
	28-45	hc1	10YR54 00 75YR56 00 F					0	0		0		M				
	45-120	c	25Y 63 00 75YR68 00 C					Y	0	0	0		P			Y	
13	0-25	hzc1	10YR43 00 10YR46 00 C					S	0	0	HR	1					
	25-50	c	25Y 63 00 10YR58 00 C					Y	0	0	0		P			Y	
	50-120	c	05Y 63 62 10YR66 00 C					Y	0	0	0		P			Y	
14	0-25	hc1	10YR33 00						0	0	HR	1					
	25-80	c	25Y 63 00 10YR66 00 C					Y	0	0	0		P			Y	
	80-120	c	05Y 62 00 10YR56 00 C					Y	0	0	0		P			Y	