A1
Swale Borough Local Plan
Objector Site Shep 2,
Land at Eastchurch,
Isle of Sheppey, Kent

Agricultural Land Classification
November 1996

Resource Planning Team
Guildford Statutory Group
ADAS Reading

ADAS Reference 2011/144/96
MAFF Reference EL 20/0245
LUPU Commission 02563

AGRICULTURAL LAND CLASSIFICATION REPORT

SWALE BOROUGH LOCAL PLAN
OBJECTOR SITE SHEP 2,
LAND AT EASTCHURCH, ISLE OF SHEPPEY, KENT

Introduction

1 This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 10 ha of land on the north eastern side of the village of Eastchurch, Isle of Sheppey Kent The survey was carried out during November 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 in 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 winter sown rape The eastern side of the site comprises two small fields of permanent grass used for horse grazing, whilst the land immediately to the north of the church comprises gardens and scrub vegetation

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	9 1	91 0	100 0
Other land	0 9	9 0	
Total surveyed area	9 1		100 0
Total site area	10 0	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 All the agricultural land on the site has been mapped as Subgrade 3a, good quality agricultural land The soils on the site comprise medium clay loam topsoils overlying slowly permeable clays at depth and therefore the land suffers from a moderate wetness and workability limitation restricting the land to this subgrade A small area of Other Land' has been mapped immediately to the north of the church

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 985 716
Altitude	m, AOD	45
Accumulated Temperature	day°C (Jan June)	1444
Average Annual Rainfall	mm	563
Field Capacity Days	days	103
Moisture Deficit, Wheat	mm	124
Moisture Deficit, Potatoes	mm	121

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 Climatic factors do interact with soil properties to influence soil wetness and droughtiness limitations The combination of rainfall and accumulated temperature at this site mean that the area is relatively dry and warm and that the field capacity days are below the average for the south east of England This decreases the likelihood of soil wetness 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 village of Eastchurch is situated on the top of a small hill and the site which is located on the northern side occupies the side slopes The altitude of the site ranges from 50 m AOD, alongside the sports field to 43 m AOD on the northern boundary Gradients on the site range from 1-4° Nowhere on the site does gradient or micro-relief impose any limitation on the agricultural use

Geology and soils

15 The published geological information for the area (BGS, 1974) shows the majority of the site to be underlain by Eocene London Clay with a small area of Eocene loam and sand the Claygate and Bagshot Beds in the vicinity of the playing field

16 There is no detailed soil survey map for the area, but the reconnaissance soil map (SSEW 1983) shows the whole site to comprise soils of the Windsor association These soils are described as Slowly permeable seasonally waterlogged clayey soils mostly with brown subsoils Some fine loamy over clayey and fine silty over clayey soils and locally on slopes clayey soils with only slight seasonal waterlogging (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 All of the agricultural land on the site has been mapped as Subgrade 3a, good quality because of moderate soil wetness and workability limitations Typical profiles comprise brown medium clay loam topsoils which overlie mottled but permeable heavy clay loam upper subsoils At approximately 40-55 cm depth these pass into lower subsoils which typically comprise light greyish brown, strongly mottled clays The lower subsoils are poorly structured and slowly permeable, having a coarse angular blocky structure These profiles are imperfectly drained and so have been assigned to Wetness Class III (see Appendix II) The interaction between the soil drainage status and medium textured topsoils with the relatively dry local climate means that Subgrade 3a is appropriate This land will be subject to some flexibility restrictions principally in terms of the timing of cultivations and stocking if structural damage to the soils is to be avoided

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

SOURCES OF REFERENCE

British Geological Survey (1974) *Sheet No* 273, *Faversham*
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 BOROUGH LP SHEP 2 Pit Number 1P

Grid Reference TQ98607170 Average Annual Rainfall 563 mm
Accumulated Temperature 1444 degree days
Field Capacity Level 103 days
Land Use Oilseed Rape
Slope and Aspect 01 degrees N

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 30	MCL	10YR43 00	0	0						
30- 45	HCL	10YR63 00	0	0		M	MDCSAB	FR	M	
45-120	C	25Y 62 00	0	0		M	STCAB	FM	P	

Wetness Grade 3A Wetness Class III
Gleying 030 cm
SPL 045 cm

Drought Grade 2 APW 134mm MBW 10 mm
APP 111mm MBP -10 mm

FINAL ALC GRADE 3A
MAIN LIMITATION Wetness

SAMPLE NO	GRID REF	USE	ASPECT	GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	DRT	M REL FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1	TQ98707180	OSR	N	01	030	075	2	2	143	19	118	-3	2				WD	2	Very mottled
1P	TQ98607170	OSR	N	01	030	045	3	3A	134	10	111	-10	2				WE	3A	
2	TQ98607170	OSR	N	01	030	045	3	3A	134	10	111	-10	2				WE	3A	
3	TQ98707170	OSR			028	050	3	3A	135	11	112	-9	2				WE	3A	
4	TQ98807170	OSR	N	02	030	065	2	2	139	15	116	-5	2				WD	2	
5	TQ98907170	PGR	N	01	030	030	3	3A	129	5	106	-15	3A				WD	3A	
6	TQ98507160	OSR	NW	02	028	028	3	3B	128	4	105	-16	3A				WE	3B	Heavy topsoil
7	TQ98607160	OSR	NW	03	030	055	3	3A	137	13	114	-7	2				WE	3A	
8	TQ98707160	OSR	N	04	030	055	3	3A	137	13	114	-7	2				WE	3A	
9	TQ98807160	OSR	N	03	030	040	3	3A	131	7	108	-13	3A				WD	3A	
10	TQ98907160	PGR			030	050	3	3A	134	10	111	-10	2				WE	3A	
11	TQ98607150	OSR	NW	04	028	028	3	3A	135	11	113	-8	2				WE	3A	

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC
1	0-30	mcl	10YR43 00						0	0		0						
	30-75	hcl	25Y 62 00	75YR56 00	M			Y	0	0		0		M				
	75-95	c	25Y 62 00	10YR56 00	M			Y	0	0		0		P	Y		Y	
	95-120	hcl	10YR63 00	10YR68 00	M			Y	0	0		0		P	Y		Y	
1P	0-30	mcl	10YR43 00						0	0		0						
	30-45	hcl	10YR63 00	10YR68 00	M			Y	0	0		0	MDCSAB	FR M				
	45-120	c	25Y 62 00	10YR68 00	M		25Y 62 00	Y	0	0		0	STCAB	FM P	Y		Y	
2	0-30	mcl	10YR43 00						0	0		0						
	30-45	hcl	10YR63 00	10YR66 00	C			Y	0	0		0		M				
	45-120	c	25Y 62 00	10YR68 00	M			Y	0	0		0		P	Y		Y	
3	0-28	mcl	10YR43 00						0	0		0						
	28-50	hcl	10YR63 62	10YR56 00	C			Y	0	0		0		M				
	50-90	c	25Y 62 00	10YR66 00	M			Y	0	0		0		P	Y		Y	
	90-120	c	10YR53 00	10YR56 00	C			Y	0	0		0		P	Y		Y	
4	0-30	mcl	10YR34 00						0	0	HR	1						
	30-65	hcl	10YR63 62	75YR56 46	C			Y	0	0		0		M				
	65-120	c	10YR63 00	75YR58 00	M			Y	0	0		0		P	Y		Y	
5	0-30	mcl	10YR43 00	05YR46 00	F				0	0		0						
	30-80	c	75YR53 00	75YR56 00	C			Y	0	0		0		P	Y		Y	
	80-120	c	10YR64 00	75YR66 00	C			Y	0	0		0		P	Y		Y	
6	0-28	hcl	10YR43 00						0	0		0						
	28-120	c	25Y 63 00	10YR68 00	M			Y	0	0		0		P	Y		Y	
7	0-30	mcl	10YR43 00						0	0		0						
	30-55	mcl	25Y 62 00	10YR56 00	C			Y	0	0		0		M				
	55-120	c	10YR53 00	10YR58 00	C			Y	0	0		0		P	Y		Y	
8	0-30	mcl	10YR43 00						0	0		0						
	30-55	hcl	25Y 63 00	10YR68 00	M			Y	0	0		0		M				
	55-95	c	25Y 63 62	10YR68 00	M			Y	0	0		0		P	Y		Y	
	95-120	c	05Y 62 00	10YR58 00	C			Y	0	0		0		P	Y		Y	
9	0-30	mcl	10YR43 00						0	0	HR	1						
	30 40	hcl	10YR62 63	75YR56 00	C			Y	0	0	HR	1		M				
	40-120	c	25Y 63 62	10YR68 00	M			Y	0	0		0		P	Y		Y	
10	0-30	mcl	10YR43 00						0	0	HR	1						
	30-50	hcl	10YR63 00	10YR66 00	C			Y	0	0		0		M				
	50-120	c	25Y 62 00	10YR68 00	M			Y	0	0		0		P	Y		Y	
11	0-28	mcl	10YR34 00						0	0	HR	1						
	28-60	c	10YR53 00	10YR66 00	C			Y	0	0		0		M	Y		Y	
	60-120	hcl	25Y 64 00	10YR66 00	C			Y	0	0		0		P	Y		Y	