

A1

**ROTHER DISTRICT LOCAL PLAN
Site 1, Cooden, Bexhill, East Sussex**

**Agricultural Land Classification
ALC Map and Report**

October 1997

**Resource Planning Team
Eastern Region
FRCA Reading**

**RPT Job Number: 4106/139/97
FRCA Reference: EL 41/498**

AGRICULTURAL LAND CLASSIFICATION REPORT

ROTHER DISTRICT LOCAL PLAN SITE 1, COODEN, BEXHILL, EAST SUSSEX

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey on approximately eight hectares to the north of Clavering Walk and to the west of Cooden Moat, Cooden, Bexhill in East Sussex. The survey was carried out during October 1997.
2. The survey was undertaken by the Farming and Rural Conservation Agency (FRCA)¹, on behalf of the Ministry of Agriculture, Fisheries and Food (MAFF). The survey was carried out in connection with MAFF's statutory input to the Rother District Local Plan. This survey supersedes any previous ALC information for this land. In addition, information from an adjacent site also surveyed in October 1997 has been used to determine the land quality on this site.
3. The work was conducted by members of the Resource Planning Team in the Eastern Region of FRCA. 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, all of the agricultural land was under permanent pasture. A relatively small area in the north-west of the site, comprising scrub and woodland, has been mapped as 'Other Land'.

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 below.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
3a	1.7	21.8	21.0
3b	6.1	78.2	75.3
Other land	0.3	N/A	3.7
Total surveyed area	7.8	100	96.3
Total site area	8.1	-	100

¹ FRCA is an executive agency of MAFF and the Welsh Office

7. The fieldwork was conducted at an average density of one boring per hectare. A total of 9 borings and one soil inspection pit was described.

8. The slightly higher land in the east of the site has been classified as Subgrade 3a (good quality) because of a soil wetness limitation. Medium silty topsoils overlie similarly textured subsoils which become poorly structured at moderate depths within the soil profile. These poorly structured layers act to impede soil drainage and, given the medium topsoils and local climate, cause some restrictions on the flexibility of cropping, stocking and cultivations.

9. The flatter and lower lying land, which occurs across most of the site, has been classified as Subgrade 3b (moderate quality). In the north of the site, seasonally high groundwater levels are likely to result in significant soil wetness limitations. Elsewhere, poorly drained soils occur where clayey horizons or dense silt rock occur directly below medium textured topsoils. Such horizons result in significant restriction of surface water movement.

10. In addition, where the dense silt rock occurs directly below the topsoil the land is also equally limited by soil droughtiness. Rooting by crops into the rock was found to be very restricted. Given the relatively dry locality these soils have reduced reserves of soil moisture. The ensuing soil droughtiness limitation is likely to result in low and inconsistent crop yields.

FACTORS INFLUENCING ALC GRADE

Climate

11. Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.

12. 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

	Units	Values	
		TQ 707 072	TQ 708 071
Grid Reference	N/A	TQ 707 072	TQ 708 071
Altitude	m, AOD	5	10
Accumulated Temperature	day°C (Jan-June)	1524	1518
Average Annual Rainfall	mm	735	735
Field Capacity Days	days	155	155
Moisture Deficit, Wheat	mm	123	122
Moisture Deficit, Potatoes	mm	121	120
Overall climatic grade	N/A	Grade 1	Grade 1

13. 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.

14. 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.

15. The combination of rainfall and accumulated temperature at this site mean that there is no overall climatic limitation. However, climatic factors do interact with soil properties to influence soil wetness and droughtiness limitations. At this locality, the soil moisture deficit values are above average for this region. The likelihood of soil droughtiness problems may therefore be increased. With regard to local climatic factors, frost risk is not believed to adversely affect the land quality on the site.

16. However, unpublished information suggests that this locality may be rather exposed (Met. Office, 1980). At the time of survey, there was no evidence of damage by salt-laden winds to the trees on this site. Given that the site is protected from south-westerly winds by the houses off Clavering Walk it was deemed that there is little or no risk of exposure at this site. All of the land on the site is, therefore, climatically Grade 1.

Site

17. The site occupies very gently sloping land (0-2°). The land falls from approximately 12 m AOD, in the east of the site, to approximately 4 m AOD, in the north-west of the site. Nowhere on the site do gradient or microrelief adversely affect agricultural land quality.

Geology and soils

18. The most detailed published geological information for the site (BGS, 1980) shows the entire site to be underlain by Tunbridge Wells Sand.

19. The most recent detailed published soil map for this area (SSEW, 1983 and 1984) shows the Curtisden Association across the site. These soils are described as 'Silty soils over siltstone with slowly permeable subsoils and slight seasonal waterlogging. Some similar well drained soils. Some well drained coarse loamy soils over sandstone. Slumping locally' (SSEW, 1983). Soils similar to this description were found across the site.

AGRICULTURAL LAND CLASSIFICATION

20. 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.

21. 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 II, page 8.

Subgrade 3a

22 The slightly higher land in the east of the site has been classified as Subgrade 3a (good quality) because of a soil wetness limitation. Topsoils comprise medium silty clay loams. These overlie similarly textured subsoils which extend to at least 120 cm depth. These profiles are very slightly stony (about 1% total hard stone) throughout. The upper subsoils are brownish, moderately structured and permeable. These pass into poorly structured and slowly permeable lower subsoils, which are pale and gleyed, at approximately 48 cm depth. These poorly structured lower subsoils act to impede soil drainage and, at this locality, result in imperfect soil drainage (Wetness Class III). The interaction between these soil drainage characteristics, the medium topsoils and the prevailing climate means that this land will have some restrictions on the flexibility of cropping, stocking and cultivations.

Subgrade 3b

23. Approximately three-quarters of the agricultural land on the site has been classified as Subgrade 3b (moderate quality). In the north of the site, the land is subject to fluctuating groundwater levels. Across the centre of the mapping unit, slowly permeable medium textured subsoils occur directly below the topsoil. In the south-west of the site, the drainage of surface water is impeded by dense silt rock which also occurs just below the topsoil. The latter gives rise to land also equally limited by soil droughtiness.

24. The lowest land occurs in the north of the site and, here, seasonally high groundwater levels are likely to result in significant soil wetness limitations. Topsoils comprise medium silty clay loams. These overlie similarly textured or heavy silty clay loam upper subsoils which pass into medium clay loam or fine sandy silt loam lower subsoils at approximately 45-55 cm depth. All of these subsoils are permeable and moderately structured. These profiles are stoneless throughout. They are either gleyed directly from the surface or just below the topsoil. Given that no slowly permeable layer occurs within 80 cm, such profiles are technically moderately well drained (Wetness Class II). However, the flat and low-lying nature of this land, which abuts the Hooe Levels, means that drainage measures are likely to prove inadequate, and that groundwater levels would be high for much of the year. At the time of survey, these profiles were very moist from the surface and saturated from below the topsoil. The predominance of hydrophilic vegetation (sedges and rushes) in the field immediately north of this area (which is also flat and low-lying) also indicates prolonged periods of waterlogging and anaerobic soil conditions. Consequently, this land was assessed as being poorly drained (Wetness Class IV).

25. Across the centre of this mapping unit, poorly drained profiles arise from slowly permeable subsoils which typically occur directly below the topsoil. Topsoils are medium textured; typically medium silty clay loams and, to a lesser extent, medium clay loams and silt loams. These pass into similarly textured subsoils. Very similar profiles were observed on an adjoining site, which was surveyed at the same time (FRCA Reference: 4106\140\97, Pit 1). From this adjoining pit, it could be seen that all of these upper horizons are pale in colour, heavily gleyed, poorly structured and slowly permeable. As such, surface water movement through these layers will be significantly reduced, resulting in poor soil drainage (Wetness Class IV).

26. In the south-west of the site, where dense silt rock occurs just below the topsoil, the land is also poorly drained. From Pit 1, which was dug in this area, it could be seen that the rock is heavily gleyed, very compact, of low porosity and poorly structured (massive subsoil units of very firm consistency). As such, the silt rock acts as a slowly permeable layer and, again, such profiles are assessed as poorly drained (Wetness Class IV).

27. Across this entire mapping unit, the interaction between the soil drainage characteristics, the medium textured topsoils and the prevailing climate means that all of this land is classified as Subgrade 3b because of soil wetness. Soil wetness of this degree adversely affects seed germination and survival, and inhibits the development of a good root system. Soil wetness also imposes restrictions on cultivations, trafficking by machinery or grazing by livestock.

28. Where the dense silt rock occurs directly below the topsoil, the land is also equally limited by soil droughtiness. From Pit 1 on this site, crop roots were observed to extend to about 60 cm depth. The interaction between such shallow soils, the restricted rooting (about 30 cm) into the siltstone bedrock and the dry prevailing climate restricts the moisture content of these profiles. Moisture balance calculations indicate that the amount of water available to a growing crop is not likely to be sufficient to meet its needs throughout the growing season. The resulting drought stress may cause the level and consistency of yields to be depressed in most years. Subgrade 3b is therefore the appropriate classification for this land.

Gillian Iles
Resource Planning Team
Eastern Region
FRCA Reading

SOURCES OF REFERENCE

British Geological Survey (1980) *Sheet Nos. 320/321, Hastings and Dungeness, 1:50,000 (solid and drift edition).*

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 (1980) *Unpublished climate data relating to old series OS 1:63,360 scale Sheet 183.*

Met. Office: Bracknell.

Met. Office (1989) *Climatological Data for Agricultural Land Classification.*

Met. Office: Bracknell.

Soil Survey of England and Wales (1983) *Sheet 6, 1:250,000 scale, Soils of South East England and accompanying legend.*

SSEW: Harpenden.

Soil Survey of England and Wales ([date]) *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 DATA

Contents:

Sample location map

Soil abbreviations - explanatory note

Soil pit descriptions

Soil boring descriptions (boring and horizon levels)

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	OTH: Other
DCW: Deciduous woodland	BOG: Bog or marsh	SAS: Set-Aside
HTH: Heathland	HRT: Horticultural crops	PLO: Ploughed

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	ST: Topsoil Stoniness
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
EX: Exposure		

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	FSST: soft, fine grained sandstone
ZR: soft, argillaceous, or silty rocks	CH: chalk
MSST: soft, medium grained sandstone	GS: gravel with porous (soft) stones
SI: soft weathered igneous/metamorphic rock	GH: gravel with non-porous (hard) stones

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	
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	FM : firm	EH : extremely hard
VF : very friable	VM : very firm	
FR : friable	EM : extremely firm	

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

SAMPLE NO.	GRID REF	USE	ASPECT	--WETNESS--			-WHEAT-		-POTS-		M.REL		EROSN	FROST	CHEM	ALC	COMMENTS
				GRDNT	GLEYS	SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	
1	TQ70560714	PGR			0		4	3B	141	18	123	2	2			WE 3B	G'water gley
2	TQ70700720	PGR	N	1	0		4	3B	164	41	131	10	1			WE 3B	G'water gley
3	TQ70800720	PGR	N	1	25	25	4	3B	105	-18	108	-13	3A			WE 3B	V pale 25
4	TQ70600710	PGR	NW	1	0	35	4	3B	113	-10	125	4	3A			WE 3B	V pale 35
5	TQ70700710	PGR	NW	1	0	35	4	3B	160	37	125	4	2			WE 3B	V pale 35
6	TQ70800710	PGR	SE	2	48	48	3	3A	159	36	124	3	2			WE 3A	V pale 48
7	TQ70900710	PGR	W	2	65	65	2	1	143	20	141	19	2			DR 2	Bedrock 65
8	TQ70600700	PGR			28	28	4	3B	92	-31	93	-29	3B			WD 3B	Bedrock 50
9	TQ70700700	PGR	W	2	30	30	4	3B	123	-33	131	-29	3B			WD 3B	Bedrock 60
10P	TQ70700700	PGR	W	2	29	29	4	3B	87	-36	90	-31	3B			WD 3B	Bedrock 60

SAMPLE	DEPTH	TEXTURE	COLOUR	-----MOTTLES-----			PED COL.	-----STONES-----			STRUCT/ CONSIST	SUBS			CALC
				COL	ABUN	CONT		GLE	>2	>6		LITH	TOT	STR	
1	0-30	MZCL	25Y 52	75YR56	C		Y	0	0	0					} groundwater
	30-45	HZCL	25Y 52	75YR56	M		Y	0	0	0		M			} gley
	45-100	MCL	25Y 62 61	75YR56	M		Y	0	0	0		M			} WC IV
2	0-30	MZCL	25Y 42	10YR56	C		Y	0	0	0					} groundwater
	30-55	MZCL	25Y 53	10YR68	M		Y	0	0	0		M			} gley
	55-100	FSZL	25Y 72 63	75YR5868	M		Y	0	0	0		M			} WC IV
3	0-25	MZCL	10YR43	75YR46	F			0	0	0					} refer to
	25-37	MZCL	25Y 71 51	10YR58	M		Y	0	0	0		P	Y		} Pit 1
	37-80	ZC	25Y 71 72	10YR68	M		Y	0	0	0		P	Y		} 4106\140\97
4	0-35	MZCL	10YR53	10YR46	C		Y	0	0	HR 1					} refer to
	35-65	MZCL	25Y 72	10YR58	M		Y	0	0	HR 1		P	Y		} Pit 1
	65-72	MZCL	25Y 71	25Y 71	C		Y	0	0	HR 1		P	Y		} 4106\140\97
5	0-35	MZCL	10YR53	10YR46	C		Y	0	0	HR 1					} refer to
	35-55	MZCL	25Y 82	10YR58	M		Y	0	0	HR 1		P	Y		} Pit 1
	55-120	MZCL	25Y 71	10YR58	M		Y	0	0	HR 1		P	Y		} 4106\140\97
6	0-29	MZCL	10YR44					0	0	HR 1					} refer to
	29-48	MZCL	10YR54					0	0	HR 1		M			} Pit 1
	48-78	MZCL	25Y 73	25Y 68	C		Y	0	0	HR 1		P	Y		} 4106\140\97
	78-120	MZCL	05Y 72	10YR68	C		Y	0	0	HR 1		P	Y		}
7	0-30	FSZL	10YR43					0	0	HR 2					
	30-65	FSZL	10YR44 54					0	0	HR 2		M			
	65-95	ZR	25Y 62 71	10YR5658	M		Y	0	0	HR 5		P	Y		See 1P, this site
8	0-28	MCL	10YR43	10YR46	F			0	0	0					
	28-50	MCL	10YR71 72	10YR5658	M		Y	0	0	0		P	Y		Q w'thrd bedrock
	50-70	ZR	10YR71	10YR56	C		Y	0	0	0		P	Y		See 1P, this site
9	0-30	ZL	10YR32 42	10YR46	F			0	0	0					
	30-60	ZR	25Y 71	10YR5658	M		Y	0	0	HR 2		P	Y		See 1P, this site
1P	0-29	ZL	10YR42					0	0	HR 2					
	29-60	ZR	05Y 71	10YR6858	M		Y	0	0	0	MASSV	VM P		Y	