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**ARUN DISTRICT LOCAL PLAN REVIEW
Site 14: Land West of Cobham Close,
Yapton, West Sussex
Agricultural Land Classification
ALC Map and Report**

April 1997

**Resource Planning Team
Eastern Region
FRCA Reading**

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AGRICULTURAL LAND CLASSIFICATION REPORT
ARUN DISTRICT LOCAL PLAN REVIEW
SITE 14:
LAND WEST OF COBHAM CLOSE, YAPTON, WEST SUSSEX

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of approximately 13.6 hectares of land to the west of Yapton, in West Sussex. The survey was carried out during March 1997.
2. The survey was carried out by the Farming and Rural Conservation Agency (FRCA) for the Ministry of Agriculture, Fisheries and Food (MAFF), in connection with MAFF's statutory input to the Arun District Local Plan. This survey supersedes previous ALC information for this land. An area of the site had previously been surveyed, RPT Job Number 4202/086/94, which is included within this site boundary, and is referred to in this report.
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 the land use on the site was arable, both wheat and barley were being grown. The areas mapped as 'Other' include an area of scrub.

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.
7. The fieldwork was conducted at an average density of 1 boring per hectare. A total of 11 borings and 1 soil pit were described.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
1			
2	10.6	78.5	78.0
3a	2.9	21.5	21.3
3b			
4			
5			
Agricultural land not surveyed		N/A	
Other land	0.1	N/A	0.7
Total surveyed area	13.5	100	99.3
Total site area	13.6	-	100

8. The site has been classified as Grade 2 (very good quality) and Subgrade 3a (good quality). The profiles typically comprise medium silty topsoils over similar or slightly heavier subsoils. The profiles have a good reserve of available water, however the locally dry climate leads to a slight soil droughtiness limitation. Soil droughtiness may affect plant growth and yield, as the supply of available water may be deficient, especially in drier years. Some profiles in this map unit also have a minor wetness limitation, where they are less permeable in the lower subsoil.

9. The Subgrade 3a unit has been classified on the basis of a slightly more severe soil wetness limitation. This is due to silty clay layers, in the lower subsoil, impeding drainage at this site. This can reduce the number of days when trafficking by machinery or grazing by animals may occur without damaging the soil, making the land less flexible for agricultural production.

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).

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.

Table 2: Climatic and altitude data

Factor	Units	Values	
		SU 975 030	SU 975 026
Grid reference	N/A	SU 975 030	SU 975 026
Altitude	m, AOD	5	5
Accumulated Temperature	day°C (Jan-June)	1543	1543
Average Annual Rainfall	mm	751	748
Field Capacity Days	days	154	153
Moisture Deficit, Wheat	mm	120	120
Moisture Deficit, Potatoes	mm	117	117
Overall climatic grade	N/A	Grade 1	Grade 1

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 the site can be classified as grade 1 on climatic factors. The amount of rainfall on site is about average for south east England, although the accumulated temperature is high for this region due to the coastal location of this site. The site is located in a rather exposed area (Meteorological Office, Bracknell 1980).

Site

14. The whole site is relatively flat. A slight valley head is visible above the location of the drain so that the land was slightly lower to the north east of the drain. There is no limitation due to gradient, microrelief or flooding on the site.

Geology and soils

15. The published geology map (BGS, 1975) shows the whole site mapped as brickearth; a drift deposit of the recent and pleistocene. Brickearth overlies the Upper Chalk and is described as a brown loam of quartz and flint sand and ferruginous clay.

16. A published soil map shows the soil mapped as two different series over the site (SSEW, 1967). Across the centre and in the south east corner of the site the deep phase of the Park Gate Series is shown. This series are gley soils due to a high groundwater table. The soils tend to be mottled from the surface with friable silty topsoils over similar finer textured subsoils. There are also areas of the deep phase of the Hook Series. These soils are gleyed brown earths developed in silty drift. Similar profiles to the soil series described above were found on site, although profiles were rarely gleyed from the surface.

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.

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 II. Soil data from survey ref: 4202/086/94 is not reproduced in this Appendix.

Grade 2

19. Most of the land has been classified as Grade 2 (very good quality) on the basis of a slight soil droughtiness limitation, and in a small area on the basis of a slight soil wetness limitation. The profiles comprise medium silty clay loam topsoils over similar, or heavy silty clay loam, subsoils. These subsoils overlie poorly structured horizons which comprise heavy silty clay loams, clays or silty clays. This lower horizon is slowly permeable and occurs at a depth of 80-95cm. This horizon impedes drainage so that there is mottling in the above horizons, however gleying does not occur within 40cm depth and thus soils are assessed as Wetness Class I. The topsoils vary from stoneless to very slightly stony (0-2% total flints, <2cm) and some of the subsoils are also very slightly stony (1-5% total flints), the remainder being stoneless. The overriding limitation within this locally dry climate is soil droughtiness, due to the combination of soil textures, structure and stone content which leads to a slight limitation in the amount of available water for crop growth. This leads to an increase in the variability of the yield of the soils, especially in drier years.

20. At occasional locations the Grade 2 land has been classified on the basis of a soil wetness and droughtiness limitation. These profiles comprise similar soils, however the slowly permeable layer occurs at a shallower depth of 75-80cm. This layer slightly impedes drainage through the profiles causing a slight wetness limitation. The soils are therefore classified as Wetness Class II and given the local climate and the topsoil textures, these soils are classified as Grade 2. The number of days when the soil is in a suitable condition for cultivation, trafficking by machinery or grazing by livestock are therefore slightly reduced.

Subgrade 3a

21. The land classified as Subgrade 3a (good quality) is characterised by a slight to moderate soil wetness limitation. These soils comprise similar profiles to those described above, however the poorly structured slowly permeable subsoil occurs at a shallower depth of 65-70cm. This reduces the drainage through the profiles leading to gleying in the horizon above. Wetness Class III is the appropriate classification for these soils and given the local climate combined with the topsoil textures the land is classified as Wetness Grade 3a. This leads to a reduction in the number of days when trafficking by machinery or grazing by animals may occur without damaging the soil, making the land less flexible for agricultural production. Wetness may also adversely affect crop growth.

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SOURCES OF REFERENCE

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Soil Survey of England and Wales (1984) *Soils and their Use in South East England*.
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Soil Survey of England and Wales (1966) *Soils of the West Sussex Coastal Plain; 1:25,000 Scale*. 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. **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	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	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 : ARUN LOCAL PLAN SITE 14 Pit Number : 1P

Grid Reference: SU97600290 Average Annual Rainfall : 751 mm
 Accumulated Temperature : 1543 degree days
 Field Capacity Level : 154 days
 Land Use : Wheat
 Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 32	MZCL	10YR33 43	0	2	HR					
32- 54	MZCL	10YR44 00	0	0		F	MDCSAB	FR	M	
54- 69	MZCL	10YR54 64	0	0		C	MDCSAB	FR	M	
69- 80	HZCL	10YR54 63	0	5	HR	C	MDCSAB	FR	M	
80-120	HZCL	25Y 63 00	0	0		M	WKCSAB	FM	P	

Wetness Grade : 2 Wetness Class : II
 Gleying : 54 cm
 SPL : 80 cm

Drought Grade : 2 APW : 144mm MBW : 24 mm
 APP : 124mm MBP : 7 mm

FINAL ALC GRADE : 2
 MAIN LIMITATION : Soil Wetness/Droughtiness

SAMPLE NO.	GRID REF	ASPECT USE	--WETNESS--		-WHEAT-		-POTS-		M.REL		EROSN	FROST		CHEM	ALC	COMMENTS
			GRONT	GLEY	SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	
1	SU97500300	WHT	60	85	1	1	160	40	124	7	2				DR 2	SEE 1P
1P	SU97600290	WHT	54	80	2	2	144	24	124	7	2				WD 2	PIT94AUG120WC1
2	SU97600300	WHT	60	85	1	1	159	39	124	7	2				DR 2	SEE 1P
3	SU97400290	WHT			1	1	160	40	124	7	2				DR 2	
4	SU97500290	WHT	85	85	1	1	162	42	126	9	2				DR 2	SL GL 65cm
5	SU97600290	WHT	50	85	1	1	150	30	125	8	2				DR 2	QC SPL 85
6	SU97400280	WHT	0	75	2	2	145	25	127	10	2				WD 2	SEE 1P
7	SU97500280	WHT	30	95	2	2	152	32	124	7	2				DR 2	
8	SU97450263	BAR	38		2	2	162	42	127	10	2				WD 2	
9	SU97580262	BAR W	01	50	50	3	3A	152	32	114	-3	2			WE 3A	
10	SU97660258	BAR	33	65	3	3A	144	24	122	5	2				WE 3A	
11	SU97750255	BAR	45	80	2	2	160	40	124	7	2				WD 2	SEE 1P

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED		----STONES----			STRUCT/		SUBS		SPL	CALC	
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH	TOT	CONSIST	STR	POR			IMP
1	0-35	mzc1	10YR44 00						0	0	HR	2					Small Flints	
	35-60	mzc1	10YR46 00						0	0		0		M				
	60-85	hzc1	10YR53 00 10YR58 00 C				00M00	00	Y	0	0	HR	2		M			
	85-120	hzc1	10YR53 62 10YR58 00 M						Y	0	0	HR	2		P	Y	Mtx also brown	
1P	0-32	mzc1	10YR33 43						0	0	HR	2						
	32-54	mzc1	10YR44 00 10YR56 00 F						0	0		0	MDCSAB	FR	M			
	54-69	mzc1	10YR54 64 10YR56 00 C				00M00	00	Y	0	0	0	MDCSAB	FR	M			
	69-80	hzc1	10YR54 63 10YR66 00 C				00M00	00	Y	0	0	HR	5	MDCSAB	FR	M		Tending WKD
	80-120	hzc1	25Y 63 00 10YR58 00 M						Y	0	0	0	WKCSAB	FM	P	Y	Y	
2	0-32	mzc1	10YR43 00						0	0	HR	2						
	32-60	mzc1	10YR53 54 10YR58 00 F				00M00	00		0	0	0		M				
	60-85	mzc1	25Y 63 62 10YR58 00 C				00M00	00	Y	0	0	0		M				
	85-120	hzc1	25Y 62 00 10YR58 68 M				00M00	00	Y	0	0	HR	5		P	Y		
3	0-25	mzc1	10YR43 00						0	0		0						
	25-75	mzc1	10YR54 00						0	0		0		M				
	75-120	mzc1	10YR53 54 10YR56 00 F						0	0		0		M				
4	0-35	mzc1	10YR43 00						0	0		0						
	35-65	mzc1	10YR58 00 10YR54 56 F						0	0		0		M				
	65-85	hzc1	10YR54 53 10YR58 00 C				00M00	00	S	0	0	0		M				
	85-120	hzc1	10YR53 00 10YR58 00 M				00M00	00	Y	0	0	0		P		Y	Query SPL	
5	0-28	mzc1	10YR43 00						0	0		0						
	28-50	mzc1	10YR44 54 00M00 00 F						0	0		0		M				
	50-65	mzc1	10YR52 53 10YR56 00 C				00M00	00	Y	0	0	0		M				
	65-85	hzc1	10YR53 00 10YR58 00 C				00M00	00	Y	0	0	0		M				
	85-120	c	25Y 62 53 10YR68 00 M						Y	0	0	0		P		Y		
6	0-40	mzc1	10YR53 54 10YR56 00 C				00M00	00	Y	0	0	0						
	40-60	mzc1	25 Y63 00 10YR58 00 C						Y	0	0	0		M				
	60-75	hzc1	25 Y63 00 10YR58 00 M						Y	0	0	0		M				
	75-120	hzc1	25 Y63 62 75YR46 00 M				00M00	00	Y	0	0	0		P		Y	Moist horizon	
7	0-30	mzc1	10YR43 53						0	0	HR	2						
	30-45	mzc1	10YR54 64 10YR58 00 C					S	0	0		0		M				
	45-95	hzc1	10YR64 62 10YR58 00 C				00M00	00	Y	0	0	0		M				
	95-120	zc	25Y 63 62 10YR68 00 M				00M00	00	Y	0	0	0		P		Y		
8	0-38	mzc1	10YR44 00						0	0		0						
	38-100	hzc1	25 Y53 63 10YR58 00 M				00M00	00	Y	0	0	0		M				
	100-120	hzc1	25 Y53 54 10YR56 00 C						Y	0	0	CH	5		P	Y	Calc	
9	0-30	mzc1	10YR43 53						0	0	HR	2						
	30-50	mzc1	10YR54 00 10YR56 00 F						0	0		0		M				
	50-70	zc	25Y 63 00 10YR58 00 M				00M00	00	Y	0	0	0		P		Y		
	70-120	mzc1	25Y 62 64 10YR58 00 M						Y	0	0	CH	5		P	Y	Y	Calc

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED		----STONES----			STRUCT/ CONSIST	SUBS			CALC	
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH		TOT	STR	POR		IMP
10	0-33	mzc1	10YR43 53						0	0	HR	2					
	33-65	hzc1	10YR62 00 10YR58 00 C				00M00	00	Y	0	0	0		M			
	65-120	zc	25Y 61 64 10YR58 68 M				00M00	00	Y	0	0	0		P		Y	
11	0-30	mzc1	10YR43 53							0	0	HR	2				
	30-45	mzc1	10YR54 00 10YR56 00 F							0	0	0		M			
	45-80	hzc1	10YR63 62 10YR58 68 M				00M00	00	Y	0	0	0		M			
	80-120	hzc1	25Y 63 00 10YR58 00 M				00M00	00	Y	0	0	0		P		Y	