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East Hampshire Local Plan
Site 683 : Land between Brislands Lane
and Winchester Road, Four Marks
Agricultural Land Classification
ALC Map and Report
February 1995

AGRICULTURAL LAND CLASSIFICATION REPORT

EAST HAMPSHIRE LOCAL PLAN

SITE 683 : LAND BETWEEN BRISLANDS LANE AND WINCHESTER ROAD, FOUR MARKS

1. Summary

- 1.1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality on a number of sites in East Hampshire. This work forms part of MAFF's statutory input to the preparation of the East Hampshire Local Plan.
- 1.2 Approximately 10 hectares of land between Brislands Lane and Winchester Road at Four Marks in Hampshire was surveyed in February 1995. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 8 soil auger borings and 1 soil inspection pit were described in accordance with MAFF's revised guidelines and criteria for grading the quality of agricultural land, (MAFF, 1988). These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose a long term limitation on its use for agriculture
- 1.3 The work was carried out by members of the Resource Planning Team in the Guildford Statutory Group of ADAS.
- 1.4 At the time of the survey the land use on the site was a mixture of permanent pasture land and unmanaged grassland. Land shown as non-agricultural comprises scrubland and woodland while urban development includes private dwellings and their gardens, farm buildings and commercial properties.
- 1.5 The distribution of grades and subgrades is shown on the attached ALC map and the areas are given in the table below. The map has been drawn at a scale of 1:10,000. It is accurate at this scale, but any enlargement would be misleading.

Table 1 : Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site	% of Agricultural Area
Subgrade 3b	5.2	53.6	100
Non-Agricultural	1.2	12.4	100% (5.2 ha)
Urban	2.3	23.6	
Woodland	0.5	5.2	
Farm Buildings	<u>0.5</u>	<u>5.2</u>	
Total area of site	9.7	100%	

- 1.6 Appendix 1 gives a general description of the grades and landuse categories identified in this survey. The main classes are described in terms of the type of limitation that can occur, the typical cropping range and expected level and consistency of yield.

1.7 All of the agricultural land on this site has been classified as moderate quality (Subgrade 3b), the key limitation being soil wetness. The profiles are derived from the clay-with-flints and as such comprise poorly drained silty over clayey soils with reddish subsoils.

2. Climate

2.1 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.

2.2 The main parameters used in the assessment of an overall climatic limitation are average annual rainfall, as a measure of overall wetness, and accumulated temperature, as a measure of the relative warmth of a locality.

2.3 A detailed assessment of the prevailing climate was made by interpolation from a 5km grid point dataset (Met. Office, 1989). The details are given in the table below and these show that there is an overall climatic limitation which will prevent this site from being classified any higher than Grade 2 due to comparatively moist and cool climatic conditions. Climatic factors also interact with soil properties to influence soil wetness and droughtiness at this locality. The high average annual rainfall (and therefore high field capacity days) in combination with the low crop adjusted soil moisture deficits increase the likelihood of soil wetness whilst decreasing that of soil droughtiness.

2.4 Climatic reports from the Meteorological Office (Met. Office, 1971) suggest this area to be rather exposed, however, at the time of survey this was not felt to have significant impact on the site. No other local climatic factors, such as frost risk, are believed to affect this area.

Table 2 : Climatic Interpolations

Grid Reference	SU665344	SU663346
Altitude (m, AOD)	175	185
Accumulated Temperature (degree days, Jan-June)	1342	1331
Average Annual Rainfall (mm)	929	933
Field Capacity (days)	202	203
Moisture Deficit, Wheat (mm)	81	80
Moisture Deficit, Potatoes (mm)	67	65
Overall Climatic Grade	2	2

3. Relief

3.1 To the north of the site the land is relatively flat, lying at an altitude of 185m AOD. Towards the south the land falls gently away to a height of about 175m

AOD in the south east corner. Nowhere on the site do altitude or relief affect the agricultural land quality.

4. Geology and Soil

- 4.1 British Geological Survey (1975), Sheet 300, (Alresford) maps the south eastern half of the site as the Upper Chalk. In the north west the geology is shown as clay-with-flints over the Upper Chalk.
- 4.2 The relevant published soil information (SSEW, 1983, 1:250,000), shows the entire site to comprise the Carstens association. These soils are described as 'well drained fine silty over clayey, clayey and fine silty soils often very flinty'. (SSEW, 1983).
- 4.3 Detailed field examination of the site broadly confirmed the existence of soils similar to those described in paragraph 4.2, though here they are poorly or imperfectly drained with very little stone.
- 4.4 Nowhere on the site was the Upper Chalk encountered within 1.2 m from the surface.

5. Agricultural Land Classification

- 5.1 Table 1 provides the details of the area measurements for each grade and the distribution of each grade is shown on the attached ALC map.
- 5.2 The location of the soil observation points are shown on the attached sample point map.

Subgrade 3b

- 5.3 The agricultural land across the site has been classified as moderate quality, Subgrade 3b, due to a moderate soil wetness and workability limitation. Brownish medium silty clay loam topsoils generally overlie a similar or marginally heavier thin upper subsoil. Occasionally clay is encountered immediately below the topsoil (28 cm) though generally it occurs at about 40 cm depth and continues to depth. The upper clay horizons are typically slightly gleyed having a yellowish matrix. Gleying occurs at 45-60 cm depth where the clay matrix is reddish with pale ped faces and common mottles. Soil inspection pit 1 revealed the gleyed clay to be poorly structured and slowly permeable resulting in a moderate drainage impedance. In this locally wet climatic regime such land has been assigned to Wetness Class IV, Subgrade 3b, as wet soils can restrict the timing of cultivations and mechanical operations and restrict the period of grazing by livestock.

ADAS Ref: 1502/008/95
MAFF Ref: EL15/468

Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1975), Sheet No 300, Alresford, 1:50,000 (drift edition).

MAFF (1988), Agricultural Land Classification of England and Wales : Revised guidelines and criteria for grading the quality of agricultural land.

Meteorological Office (1971), Unpublished Climate Data.

Meteorological Office (1989), Climatological Data for Agricultural Land Classification.

Soil Survey of England and Wales (1983), Soils of South-East England (map and accompanying legend.)

APPENDIX I

DESCRIPTION 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 (eg. 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.

Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture including: housing, industry, commerce, education, transport, religious buildings, cemeteries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

Non-agricultural

'Soft' uses where most of the land could be returned relatively easily to agriculture, including: private parkland, public open spaces, sports fields, allotments and soft-surfaced areas on airports. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

Woodland

Includes commercial and non-commercial woodland. A distinction may be made as necessary between farm and non-farm woodland.

Agricultural Buildings

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (eg. polythene tunnels erected for lambing) may be ignored.

Open Water

Includes lakes, ponds and rivers as map scale permits.

Land Not Surveyed

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above, eg. buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will be shown.

APPENDIX II

FIELD ASSESSMENT OF SOIL WETNESS CLASS

SOIL WETNESS CLASSIFICATION

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.

Definition of Soil Wetness Classes

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.

Soils can be allocated to a wetness class on the basis of quantitative data recorded over a period of many years or by the interpretation of soil profile characteristics, site and climatic factors. Adequate quantitative data will rarely be available for ALC surveys and therefore the interpretative method of field assessment is used to identify soil wetness class in the field. The method adopted here is common to ADAS and the SSLRC.

¹The number of days specified is not necessarily a continuous period.

²'In most years' is defined as more than 10 out of 20 years.

APPENDIX III

SOIL PIT AND SOIL BORING DESCRIPTIONS

Contents :

Soil Abbreviations - Explanatory Note

Soil Pit Descriptions

Database Printout - Boring Level Information

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

SAMPLE NO.	GRID REF	ASPECT USE	--WETNESS--				-WHEAT-		-POTS-		M. REL		EROSN	FROST	CHEM	ALC	COMMENTS
			GRDNT	GLEY	SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT	
1	SU66153457	PGR		S48	48	3	3A	139	59	118	53	1			WE	3A	
2	SU66303460	RGR		S38	38	4	3B	138	58	117	52	1			WE	3B	
3	SU66403460	RGR		S28	28	4	3B	110	30	111	46	1			WE	3B	
4	SU66373440	RGR		S40	40	3	3A	138	58	115	50	1			WE	3A	BORDER 3B
5	SU66303450	RGR		S38	38	4	3B	137	57	115	50	1			WE	3B	
6	SU66403450	RGR	S	1	S28	28	4	3B	135	55	111	46	1		WE	3B	
7	SU66403440	RGR	S	1	S28	28	4	3B	134	54	111	46	1		WE	3B	
8	SU66503440	RGR	S	3	S38	38	4	3B	136	56	113	48	1		WE	3B	
1P	SU66303450	RGR		S35	35	4	3B	103	23	111	46	2			WE	3B	

SAMPLE	DEPTH	TEXTURE	COLOUR	---MOTTLES---			PED COL.	---STONES---			STRUCT/ CONSIST	SUBS			CALC		
				COL	ABUN	CONT		GLEY	>2	>6		LITH	TOT	STR		POR	IMP
1	0-28	MZCL	10YR54					1	0	HR	2					see1502/115/95	
	28-48	MZCL	75YR54					0	0	HR	2	M					
	48-60	C	75YR56					S	0	0	CH	1	M		Y		
	60-120	C	25YR46	10YR56	C	D		Y	0	0	CH	2	P	Y	Y	RED SOIL	
2	0-28	MZCL	10YR54					1	0	HR	2					see1502/115/95	
	28-38	HZCL	75YR54					0	0	HR	2	M					
	38-60	C	75YR56					S	0	0	CH	2	M		Y		
	60-95	C	05YR46	10YR56	C	D		Y	0	0	CH	2	P	Y	Y	RED SOIL	
	95-120	C	25YR46	10YR56	M	D		Y	0	0	CH	2	P	Y	Y	RED SOIL	
3	0-28	MZCL	10YR53					2	0	HR	5					see1502/115/95	
	28-50	C	75YR56					S	0	0	CH	5	M		Y		
	50-85	C	25YR46	10YR56	M	D		Y	0	0	CH	2	P	Y	Y	RED SOIL	
4	0-28	MZCL	10YR53					1	0	HR	2					see1502/115/95	
	28-40	HZCL	10YR54					0	0	HR	2	M					
	40-55	C	75YR56					S	0	0	CH	2	M		Y		
	55-85	C	05YR46	10YR56	C	D		Y	0	0	CH	2	P	Y	Y	RED SOIL	
	85-120	C	25YR46	10YR56	M	D		Y	0	0	CH	2	P	Y	Y	RED SOIL	
5	0-28	MZCL	10YR53					1	0	HR	2					see1502/115/95	
	28-38	MZCL	10YR54					0	0	HR	2	M					
	38-55	C	75YR56					S	0	0	CH	2	M		Y		
	55-85	C	05YR46	10YR56	C	D		Y	0	0	CH	2	P	Y	Y	RED SOIL	
	85-120	C	25YR46	10YR56	M	D		Y	0	0	CH	2	P	Y	Y	RED SOIL	
6	0-28	MZCL	10YR53					2	0	HR	5					see1502/115/95	
	28-50	C	75YR56					S	0	0	CH	2	M		Y		
	50-95	C	05YR46	10YR56	M	D		Y	0	0	CH	2	P	Y	Y	RED SOIL	
	95-120	C	25YR46	10YR56	M	D		Y	0	0	CH	2	P	Y	Y	RED SOIL	
7	0-28	MZCL	10YR53					1	0	HR	3					see1502/115/95	
	28-45	C	75YR56					S	0	0	CH	2	M		Y		
	45-85	C	05YR46	10YR56	C	D	COM MN	Y	0	0	CH	2	P	Y	Y	RED SOIL	
	85-120	C	25YR46	10YR56	M	D	COM MN	Y	0	0	CH	2	P	Y	Y	RED SOIL	
8	0-28	MZCL	10YR53					2	0	HR	5						
	28-38	HZCL	75YR54 56					0	0	HR	2	M					
	38-45	C	75YR56					S	0	0	HR	2	M		Y		
	45-55	C	75YR56					S	0	0	CH	5	M		Y		
	55-95	C	05YR46	10YR56	C	D	COM MN	Y	0	0	CH	2	P		Y		
	95-120	C	25YR46	10YR56	M	D	COM MN	Y	0	0	CH	10	P		Y		
1P	0-20	MZCL	10YR54					4	0	HR	3					see1502/115/95	
	20-35	MZCL	75YR54					0	0	HR	4	MDCSAB	FR	M			
	35-50	C	75YR56					S	0	0	CH	1	MDCAB	FR	M	Y	Y
	50-75	C	25YR46	10YR56	M	D	05YR54	Y	0	0	CH	1	MDCPL	FR	P	Y	Y