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Eastleigh District Local Plan
Land east of Hedge End, Hampshire
Agricultural Land Classification
ALC Map and Report
June 1995

AGRICULTURAL LAND CLASSIFICATION REPORT

EASTLEIGH DISTRICT LOCAL PLAN
LAND EAST OF HEDGE END, HAMPSHIRE

Summary

1.1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality for a number of sites in the vicinity of Eastleigh . This work was in connection with the Eastleigh District Local Plan.

1.2 The site comprises approximately 8.0 ha of land on the eastern side of Hedge End. This area was surveyed previously by ADAS in July 1980 as part of an Agricultural Land Classification (ALC) survey for the West End, Hedge End and Botley area. The survey was carried out at a reconnaissance level using the original ALC system and the area was mapped as subgrade 3a (ADAS, 1980). A detailed ALC survey of the site has now been carried out during June 1995 and a total of 9 borings and 1 soil inspection pit were assessed 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 long term limitations 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 survey, the agricultural land was all in grass and used for horse grazing with the exception of the field at the north west of the site which was derelict, being covered with rough grass, small trees and brambles. The southern part of this field has now established as an area of young oak woodland. Three areas of urban land have been mapped which comprise residential buildings and associated hard surfaced access roads. Two small farm tracks have been mapped as non-agricultural together with two small areas of old buildings.

1.5 The distribution of the 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. This map supersedes any previous survey information for this site.

Table 1 : Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site	% of Agricultural Area
3a	3.9	48.7	68.4
3b	1.8	22.5	31.6
Non Agricultural	0.6	7.5	**100% (5.7 ha)**
Woodland	0.5	6.3	
Urban	1.2	15.0	
Total	**8.0ha**	**100%**	

1.6 A general description of the grades, subgrades and land use categories is provided in Appendix I. The main classes are described in terms of the type of limitation that can occur, the typical cropping range and the expected level and consistency of yield.

1.7 The majority of the agricultural land on the site has been graded as 3a, good quality agricultural land with two smaller areas of subgrade 3b, moderate quality agricultural land. The major limitation associated with the land classified as subgrade 3a is wetness, due to the presence of fine loamy upper horizons overlying slowly permeable clayey subsoils. The area mapped as subgrade 3b at the south of the site has been limited to this grade due to a moderately severe droughtiness limitation. The soils in this area are sandy and therefore have low available water capacities. The 3b land at the north of the site has been restricted to this grade due to disturbance.

2. Climate

2.1 The climatic criteria are considered first when classifying land as climate can be overriding in the sense that severe climatic limitations will restrict land to low grades irrespective of favourable site or soil conditions.

Table 2 : Climatic Interpolation

Grid Reference	SU 501 125
Altitude (m)	20
Accumulated Temperature (Day °C, Jan-June)	1532
Average Annual Rainfall (mm)	815
Field Capacity (days)	167
Moisture Deficit, Wheat (mm)	111
Moisture Deficit, Potatoes (mm)	106
Overall Climatic Grade	1

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 (day °C Jan-June), 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 gridpoint dataset (Met. Office 1989). The details are given in the table 2 and these show that there is no overall climatic limitation affecting the site.

2.4 However, climatic factors do interact with soil factors to influence soil wetness and droughtiness limitations. The climate at this location is relatively warm and moist in a regional context, therefore the likelihood of a soil wetness limitation may be increased.

2.5 No local climatic factors such as exposure or frost risk are believed to affect the site.

3. Relief

3.1 The site is located on the eastern boundary of the built up area and the land falls very gently to the east. The altitude is approximately 20 m AOD and consequently altitude and relief do not constitute any limitation to the agricultural use of the area.

4. Geology and Soils

4.1 The published geological map (BGS, 1987) shows the whole site to be underlain by the Bracklesham Beds, which comprise mainly interbedded clay and silty sands with thin loamy intercalations.

4.2 The published Soil Survey map (SSEW, 1983) shows the soils on the site to comprise those of the Wickham 4 association. These are described as 'slowly permeable seasonally waterlogged fine loamy over clayey and fine silty over clayey soils associated with similar clayey soils often with brown subsoils' (SSEW 1983). The more detailed soil map for the area (SSLRC, 1989) which stops at the northern tip of the site shows the land immediately to the north to comprise Wix/Hucklesbrook series, which are described as soils with sandy loam topsoils becoming increasingly clayey with depth.

4.3 Detailed field examination found the majority of the site to comprise fine loamy over clayey soils. A typical soil profile has a medium clay loam topsoil over a heavy clay loam upper subsoil which overlies sandy clay at depth. At the southern end of the site however, the soils are predominantly sandy having a loamy sand topsoil overlying sand.

5. Agricultural Land Classification

5.1 The location of the soil observation points are shown on the attached sample point map.

Grade 3a

5.2 The majority of the site has been classified as subgrade 3a due to a moderate wetness limitation. The soils in this area typically have a medium clay loam topsoil overlying a brownish, heavy clay loam upper subsoil with distinct ochreous mottling. Below approximately 45-50 cm depth the subsoil becomes a pale grey mottled (gleyed) heavy clay loam or sandy clay with a coarse angular blocky structure, becoming massive with depth. These soils are typically assessed as wetness class III, restricting the land quality to this subgrade.

Subgrade 3b

5.3 Two areas of subgrade 3b have been identified on this site. Land at the southern end of the site has been restricted to this subgrade due to a moderately severe droughtiness limitation.

The soils in this area have a loamy medium sand topsoil overlying a medium sand subsoil, which displays ochreous mottling at depth. These soils are assessed as wetness class I, however, there is a fluctuating groundwater table, indicating some waterlogging at depth in the profile during the wetter periods of the year. The sandy nature of the soils means they will have a moderately low available water and moisture balance calculations indicate they will be very droughty restricting the land quality to subgrade 3b.

5.4 Land at the northern end of the site has also been restricted to this subgrade due to disturbance. Soil observations in this area revealed both very stony soils and fine loamy soils with buried topsoil layers and consequently the area has been restricted to this subgrade.

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ADAS Ref: 1503/116/95
MAFF Ref: EL 15/00584

SOURCES OF REFERENCE

British Geological Survey (1987), Sheet No. 315, Southampton, 1:50,000 Series (drift edition).

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

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

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

Soil Survey and Land Research Centre (1989), Applied Soil Mapping in the Southampton Area.

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.

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.

[1]The 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. **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				

8. **STRUCT** : the degree of development, size and shape of soil peds are described using the following notation:

degree of development	**WK** : weakly developed **ST** : strongly developed	**MD** : moderately developed
ped size	**F** : fine **C** : coarse	**M** : medium **VC** : very coarse
ped shape	**S** : single grain **GR** : granular **SAB** : sub-angular blocky **PL** : platy	**M** : massive **AB** : angular blocky **PR** : prismatic

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 appropiate 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 : EASTLEIGH DLP HEDGE END Pit Number : 1P

Grid Reference: SU50101254 Average Annual Rainfall : 815 mm
Accumulated Temperature : 1532 degree days
Field Capacity Level : 167 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- 23	MCL	10YR44 00	3	4	HR	C				
23- 47	HCL	10YR54 00	0	1	HR	C	MDCSAB	FM	M	
47- 70	HCL	10YR63 00	0	0		M	MDCAB	FM	P	
70-120	SC	05Y 62 00	0	0		M	MASS	FM	P	

Wetness Grade : 3A Wetness Class : III
Gleying :047 cm
SPL :047 cm

Drought Grade : 2 APW : 135mm MBW : 24 mm
APP : 105mm MBP : -1 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	M.REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1	SU50101254	PGR	E	01	025	050	3	3A	138	27	108	2	2				WE	3A	
1P	SU50101254	PGR	E	01	047	047	3	3A	135	24	105	-1	2				WE	3A	
3	SU50201280	RGR	E	01	000				000	0	000	0	3B			Y	WD	3B	DISTURB
4	SU50301280	RGR	E		050	050	3	3A	000	0	000	0				Y	WE	3A	DISTURB
5	SU50221279	RGR	E	01	030		4	3B	000	0	000	0				Y	WE	3B	DISTURB
6	SU50301270	PGR	E		045	045	3	3A	000	0	000	0					WE	3A	
7	SU50201260	PGR	E	01	027	050	3	3A	000	0	000	0					WE	3A	
8	SU50101250	PGR	E	01	060	060	3	3A	134	23	106	0	2				WE	3A	
9	SU50101240	PGR			025		1	1	113	2	94	-12	3A				DR	3A	
10	SU50101230	RGR			070		1	1	71	-40	52	-54	3B				DR	3B	

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL.	GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC
1	0-25	mcl	10YR44 00	75YR56 00	C				0	0	HR	2						
	25-50	hcl	10YR54 00	75YR56 00	C			S	0	0		0		M				
	50-70	hcl	10YR63 00	75YR56 00	M			Y	0	0		0		P		Y		
	70-120	sc	05Y 62 00	75YR56 00	M			Y	0	0		0		P		Y		
1P	0-23	mcl	10YR44 00	75YR56 00	C				3	0	HR	4						
	23-47	hcl	10YR54 00	75YR56 00	C			S	0	0	HR	1	MDCSAB FM	M				
	47-70	hcl	10YR63 00	75YR58 00	M			Y	0	0		0	MDCAB FM	P		Y		
	70-120	sc	05Y 62 00	75YR58 00	M			Y	0	0		0	MASS FM	P		Y		
3	0-30	msl	10YR43 00						0	0	HR	8						
	30-40	mcl	10YR54 00						0	0	HR	35	M					
4	0-30	mcl	10YR43 00						0	0	HR	5						
	30-50	mcl	10YR54 00	75YR56 00	F				0	0		0						
	50-120	sc	05Y 63 00	10YR68 00	M			Y	0	0		0		P		Y		
5	0-30	msl	75YR43 00						0	0	HR	5						
	30-40	hcl	10YR53 00	75YR56 00	C			Y	0	0		0				Y		Q SPL
	40-50	scl	75YR43 00						0	0		0						
	50-120	sc	05Y 63 00	10YR68 00	M			Y	0	0		0				Y		
6	0-30	mcl	25Y 43 00						0	0	HR	4						
	30-45	hcl	25Y 44 00						0	0		0						
	45-120	sc	10Y 43 00	75YR58 00	M			Y	0	0		0		P		Y		
7	0-27	mcl	10YR43 00	75YR56 00	C				0	0	HR	3						
	27-50	hcl	10YR53 00	10YR68 00	C			Y	0	0		0						
	50-70	c	25Y 73 00	10YR68 00	M			Y	0	0		0				Y		
	70-120	sc	05Y 73 00	10YR66 00	M			Y	0	0		0				Y		
8	0-23	mcl	10YR44 00						0	0	HR	2						
	23-30	mcl	10YR54 00						0	0	HR	10		M				
	30-60	mcl	10YR55 00						0	0	HR	10		M				
	60-75	hcl	25Y 64 00	75YR68 00	M			Y	0	0	HR	4		P		Y		
	75-120	sc	05Y 73 00	75YR68 00	M			Y	0	0	HR	4		P		Y		
9	0-25	msl	10YR43 00						0	0	HR	2						
	25-50	msl	10YR63 00	05YR46 00	C			Y	0	0		0		M				
	50-70	lms	10YR63 00	75YR46 00	C			Y	0	0		0		M				
	70-120	lms	25Y 54 00	00MN00 00	M			Y	0	0		0		M				
10	0-28	lms	10YR43 00						0	0	HR	3						
	28-45	ms	10YR55 00						0	0	HR	3		M				
	45-70	ms	10YR63 00	75YR56 00	F				0	0		0		M				
	70-90	ms	10YR64 00	75YR56 00	C			Y	0	0		0		M				
	90-120	lms	25Y 64 00	75YR58 00	C			Y	0	0		0		M				