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**EAST HAMPSHIRE DISTRICT LOCAL PLAN**  
**Land East of Green Lane, Clanfield, Hampshire**

**Agricultural Land Classification**  
**ALC Map and Report**

**May 1998**

**Resource Planning Team**  
**Eastern Region**  
**FRCA Reading**

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**AGRICULTURAL LAND CLASSIFICATION REPORT**  
**EAST HAMPSHIRE DISTRICT LOCAL PLAN**  
**LAND EAST OF GREEN LANE, CLANFIELD, HAMPSHIRE**

**INTRODUCTION**

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 8.6 hectares of land to the east of Green Lane at Clanfield in Hampshire. The survey was carried out during May 1998.
2. The survey was undertaken by the Farming and Rural Conservation Agency (FRCA)<sup>1</sup>, on behalf of the Ministry of Agriculture, Fisheries and Food (MAFF), in connection with its statutory input to the East Hampshire District Local Plan. This survey supersedes any previous ALC information for this land.
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 agricultural land on this site was in permanent grass which was being grazed by horses and cattle. The areas mapped as 'Other Land' comprise a large gateway to the north of the site and a fenced public recreational area, with some play equipment, to the south.

**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.
7. The fieldwork was conducted at an average density of 1 boring for every hectare of agricultural land. In total, 10 borings and 1 soil pit were described.

**Table 1: Area of grades and other land**

Grade/Other land	Area (hectares)	% surveyed area	% site area
3a	8.3	100	96.5
Other land	0.3	-	3.5
Total surveyed area	8.6	100	96.5
Total site area		-	100

<sup>1</sup> FRCA is an executive agency of MAFF and the Welsh Office.

8. The agricultural land at this site has been classified as entirely Subgrade 3a (good quality). The principal limitation is soil droughtiness with topsoil stoniness often also having an influence.

9. Soils across the site comprise medium silty clay loam topsoils and upper subsoils which overlie weathered chalky drift and pure chalk at shallow to moderate depths. Chalk has the effect of reducing rooting depths to the extent that, in this local climate, the water available to plants is moderately restricted so leading to a soil droughtiness limitation. Soil droughtiness is likely to cause the level and consistency of yields to be adversely affected, especially in drier years. In addition, the volume of stones within the topsoil frequently restricts land quality to this subgrade. Topsoil stoniness adversely affects land quality as it increases production costs by additional wear and tear on agricultural machinery. It can also adversely affect crop establishment and growth and will commonly result in a reduction in crop quality.

### FACTORS INFLUENCING ALC GRADE

#### Climate

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

11. 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		
		SU 706 162	SU 708 162	SU 709 160
Grid reference	N/A	SU 706 162	SU 708 162	SU 709 160
Altitude	m, AOD	95	105	110
Accumulated Temperature	day°C (Jan-June)	1441	1429	1423
Average Annual Rainfall	mm	921	928	928
Field Capacity Days	days	202	203	203
Moisture Deficit, Wheat	mm	95	93	93
Moisture Deficit, Potatoes	mm	85	83	82
Overall climatic grade	N/A	Grade 1	Grade 1	Grade 1

12. 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.

13. 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 (ATO, January to June), as a measure of the relative warmth of a locality.

14. The combination of rainfall and temperature at this site means that there is no overall climatic limitation. However, data from the Met. Office (1969) indicates that the site is in a

general area described as 'rather exposed' to winds from the south or south-west. The detailed setting of the site means that the urban edge of Clanfield provides protection to the land in the south and west but the rather more elevated land beyond the north-east boundary of the surveyed area may experience an exposure limitation. The degree of limitation has been assessed as no more than slight. Other local climatic factors such as frost risk are not believed to affect the site.

### **Site**

15. The site lies at altitudes between approximately 95 and 110m AOD lying on the eastern flank of a wide dry valley. Towards the west the surveyed area is relatively flat, at around 95m AOD. The land then rises gently to the east to a maximum of 110m AOD in the east of the site. Gradients within the survey area are not sufficient to adversely affect agricultural land quality. Other local factors such as microrelief and flooding are not important at the site.

### **Geology and soils**

16. The published geological information for the site (BGS, 1971) shows the entire survey area to be underlain by Cretaceous Upper Chalk.

17. The most detailed published soils information for the site (SSEW, 1983 and 1984) shows the whole area to comprise soils from the Andover 2 association. These are described as, 'Shallow humose fine loamy calcareous soils over chalk or chalk rubble with ground water controlled by ditches and pumps' (SSEW, 1983). Soils of this general description were found across the site although the sloping nature of the site precludes the need for groundwater control.

### **AGRICULTURAL LAND CLASSIFICATION**

18. 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.

19. The location of the auger borings and pits is shown on the attached sample location map and details of the soil data collected are presented in Appendix II.

### **Subgrade 3a**

20. Land of good quality has been mapped across the area surveyed. The principal limitation is soil droughtiness with topsoil stoniness being equally limiting on a number of occasions. The soils are characterised by the soil pit, 1P (see Appendix II).

21. The soils encountered typically comprise a calcareous, medium silty clay loam topsoil passing to similar or heavy silty clay loam subsoils which overlie chalk at shallow to moderate depths. No evidence of soil wetness was observed within the profiles and, as such, they are all assigned to Wetness Class I. The stone volumes assessed during the survey are variable across both the site and within each profile. These form a major aspect of the classification at this site as they directly affect the amount of water available to crops. In the topsoil at 1P a maximum of 40% flints by volume (including 25% >2cm diameter) was recorded with 15-25%

and 8-13% >2cm diameter being more typical. Stone contents in the subsoil horizons were assessed as being in the range from 5% to 30% flints by volume with, in addition, up to 50% chalk fragments. Generally chalk content increases as the substrate is approached. In the pit, roots were observed to penetrate 20cm into the blocky and weathered chalk substrate. The combination of the stone content and the rooting restriction into the chalk causes the amount of moisture available for extraction by roots to be inadequate to fully meet crop needs. In the locally wet climate, moisture balance calculations indicate that Subgrade 3a is appropriate. Soil droughtiness can cause the level and consistency of yields to be affected, especially in drier years. In addition the majority of the observations contained at least 10% flints >2cm in the top 25cm of the profile. This adversely affects crop establishment and increases production costs by causing increased wear and tear on cultivation implements such as tractor tyres to the extent that Subgrade 3a is appropriate on this basis also. Occasional observations of both slightly better and poorer quality were assessed during the survey, but their scattered location prohibits separate mapping.

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## SOURCES OF REFERENCE

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Soil Survey of England and Wales (1983) *Soils of South East England. 1:250 000 Scale.*  
SSEW: Harpenden.

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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:

<b>ARA:</b>	Arable	<b>WHT:</b>	Wheat	<b>BAR:</b>	Barley
<b>CER:</b>	Cereals	<b>OAT:</b>	Oats	<b>MZE:</b>	Maize
<b>OSR:</b>	Oilseed rape	<b>BEN:</b>	Field beans	<b>BRA:</b>	Brassicac
<b>POT:</b>	Potatoes	<b>SBT:</b>	Sugar beet	<b>FCD:</b>	Fodder crops
<b>LIN:</b>	Linseed	<b>FRT:</b>	Soft and top fruit	<b>FLW:</b>	Fallow
<b>PGR:</b>	Permanent pasture	<b>LEY:</b>	Ley grass	<b>RGR:</b>	Rough grazing
<b>SCR:</b>	Scrub	<b>CFW:</b>	Coniferous woodland	<b>OTH:</b>	Other
<b>DCW:</b>	Deciduous woodland	<b>BOG:</b>	Bog or marsh	<b>SAS:</b>	Set-Aside
<b>HTH:</b>	Heathland	<b>HRT:</b>	Horticultural crops	<b>PLO:</b>	Ploughed

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:

<b>MREL:</b>	Microrelief limitation	<b>FLOOD:</b>	Flood risk	<b>EROSN:</b>	Soil erosion risk
<b>EXP:</b>	Exposure limitation	<b>FROST:</b>	Frost prone	<b>DIST:</b>	Disturbed land
<b>CHEM:</b>	Chemical limitation				

9. **LIMIT:** The main limitation to land quality. The following abbreviations are used:

<b>OC:</b>	Overall Climate	<b>AE:</b>	Aspect	<b>ST:</b>	Topsoil Stoniness
<b>FR:</b>	Frost Risk	<b>GR:</b>	Gradient	<b>MR:</b>	Microrelief
<b>FL:</b>	Flood Risk	<b>TX:</b>	Topsoil Texture	<b>DP:</b>	Soil Depth
<b>CH:</b>	Chemical	<b>WE:</b>	Wetness	<b>WK:</b>	Workability
<b>DR:</b>	Drought	<b>ER:</b>	Erosion Risk	<b>WD:</b>	Soil Wetness/Droughtiness
<b>EX:</b>	Exposure				

### Soil Pits and Auger Borings

1. **TEXTURE:** soil texture classes are denoted by the following abbreviations:

<b>S:</b>	Sand	<b>LS:</b>	Loamy Sand	<b>SL:</b>	Sandy Loam
<b>SZL:</b>	Sandy Silt Loam	<b>CL:</b>	Clay Loam	<b>ZCL:</b>	Silty Clay Loam
<b>ZL:</b>	Silt Loam	<b>SCL:</b>	Sandy Clay Loam	<b>C:</b>	Clay
<b>SC:</b>	Sandy Clay	<b>ZC:</b>	Silty Clay	<b>OL:</b>	Organic Loam
<b>P:</b>	Peat	<b>SP:</b>	Sandy Peat	<b>LP:</b>	Loamy Peat
<b>PL:</b>	Peaty Loam	<b>PS:</b>	Peaty Sand	<b>MZ:</b>	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:

<b>F:</b>	Fine (more than 66% of the sand less than 0.2mm)
<b>M:</b>	Medium (less than 66% fine sand and less than 33% coarse sand)
<b>C:</b>	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	ASPECT USE	GRDNT	--WETNESS--		-WHEAT-		-POTS-		M.REL		EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
				GLEY	SPL	CLASS	GRADE	AP	MB	AP	MB					
1	SU70601620	PGR			1	2	67	-26	67	-16	3B			DS	3A	IMP FLINTS 45
2	SU70701620	PGR N	2		1	2	104	11	100	17	2			DS	2	IMP 100
3	SU70801620	PGR NW	2		1	2	88	-5	86	3	3A			DR	3A	IMP 70
4	SU70621613	PGR N	2		1	2	81	-12	86	3	3A			DS	3A	IMP 70
5	SU70701610	PGR N	2		1	2	86	-7	92	9	3A			DS	3A	1P LOCATION
6	SU70801610	PGR NW	2		1	2	77	-16	82	-1	3A			DR	3A	CH NOTIMP 70
7	SU70801659	PGR NW	2		1	2	82	-11	84	1	3A			DS	3A	IMP FLINTS 60
8	SU70901669	PGR NW	3		1	2	72	-21	75	-8	3B			DS	3A	IMP 55
9	SU70691636	PGR			1	2	81	-12	82	-1	3A			TS	3B	IMP 70
10	SU70831631	PGR N	3		1	2	84	-9	88	5	3A			DS	3A	IMP 60
1P	SU70701610	PGR NW	2		1	2	81	-12	87	4	3A			TS	3B	PIT75 ROOTS70

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----			PED		----STONES----			STRUCT/ CONSIST	SUBS					
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH		TOT	STR	POR	IMP	SPL	CALC
1	0-15	MZCL	10YR42						12	3	HR	27						
	15-45	MZCL	10YR43						0	0	HR	10		M			Y	IMP FLINTS 45
2	0-20	MZCL	10YR42						8	2	HR	15						
	20-30	HZCL	10YR43						0	0	HR	5		M				
	30-70	MZCL	10YR64						0	0	CH	50		M			Y	+5% FLINTS
	70-90	CH	10YR81						0	0	HR	3		P			Y	IMP CHALK 100
3	0-22	MZCL	10YR43						8	2	HR	25						
	22-45	HZCL	10YR44						0	0	HR	30		M				
	45-60	MZCL	10YR54 81						0	0	CH	50		P			Y	+15% FLINTS
	60-83	CH	10YR81						0	0	HR	3		P			Y	IMPCH 70 5%SOIL
4	0-20	MZCL	10YR42						10	3	HR	25						
	20-30	MZCL	10YR43						0	0	HR	5		M			Y	
	30-42	HZCL	10YR64						0	0	CH	50		M			Y	+3% FLINTS
	42-68	CH	10YR81						0	0	HR	3		P			Y	IMP CHALK 70
5	0-20	MZCL	10YR42						10	3	HR	25						1P LOCATION
	20-35	MZCL	10YR43						0	0	HR	5		M				
	35-50	HZCL	10YR64						0	0	CH	50		M			Y	+5% FLINTS
	50-70	CH	10YR81						0	0	HR	3		P			Y	
6	0-30	MZCL	10YR42 43						8	2	HR	20					Y	+3% CHALK
	30-40	CH	10YR81 54						0	0	HR	5		P			Y	20% SOIL
	40-68	CH	10YR81						0	0	HR	3		P			Y	IMPCH 70 5%SOIL
7	0-28	MZCL	10YR43						10	3	HR	30						
	28-40	HZCL	10YR44						0	0	HR	30		M			Y	+5% CHALK
	40-65	MZCL	10YR64 81						0	0	CH	40		M			Y	+20%HR IFLINT65
8	0-25	MZCL	10YR42 43						13	6	HR	25					Y	+3% CHALK
	25-35	MZCL	10YR44						0	0	CH	40		M			Y	+10% FLINTS
	35-63	CH	10YR81 64						0	0	HR	3		P			Y	IMPCH 55 20%SOIL
9	0-28	MZCL	10YR43						25	10	HR	40						
	28-40	MZCL	10YR44						0	0	HR	25		M			Y	
	40-55	MZCL	10YR64 81						0	0	CH	50		M			Y	+5% FLINTS
	55-78	CH	10YR81 64						0	0	HR	3		P			Y	IMPCH 70 10%SOIL
10	0-20	MZCL	10YR43						10	0	HR	20						
	20-35	MZCL	10YR43						0	0	HR	10		M			Y	
	35-73	CH	10YR81						0	0	HR	3		P			Y	IMP CHALK 60
1P	0-20	MZCL	10YR42						17	8	HR	27						VAR STONES SEE 5
	20-32	MZCL	10YR43						0	0	HR	20	MDCSAB	FR	M	N	Y	+5% CHALK
	32-50	MZCL	10YR64						0	0	HR	5			M		Y	+50% CHALK
	50-70	CH	10YR81						0	0	HR	3			P		Y	NORTS70+ 10%SOIL