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Fareham Borough Local Plan
Land at Catisfield Paddocks, Fareham, Hampshire

Agricultural Land Classification
ALC Map and Report

September 1997

Resource Planning Team
Eastern Region
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AGRICULTURAL LAND CLASSIFICATION REPORT

FAREHAM BOROUGH LOCAL PLAN
LAND AT CATISFIELD PADDOCKS

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 9.1 ha of land at Catisfield, to the west of Fareham. The survey was carried out during September 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), in connection with its statutory input to the Fareham Borough 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 land use on the site was permanent grazing, the southern fields were horse paddocks. The areas mapped as 'Other land' include residential dwellings and gardens. There was also an area of hedge planting.

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.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
2	5.1	60.0	56.0
3b	3.4	40.0	37.4
Other land	0.6	N/A	6.6
Total surveyed area	8.5	100	93.4
Total site area	9.1	-	100

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

7. The fieldwork was conducted at an average density of 1 boring per hectare of agricultural land. A total of 10 borings and 2 soil pits were described.

8. The land on this site has been mapped as Grade 2, very good quality, agricultural land and Subgrade 3b, moderate quality, agricultural land. Soil droughtiness is the main limitation across the site. Across most of the site the combination of soil characteristics in particular slight stone content, and the prevailing climate slightly restricts the available water for crops and Grade 2 is mapped. On the higher land, plateau gravel underlies the soil at shallow depth causing a significant soil droughtiness limitation and Subgrade 3b is mapped. Soil droughtiness may cause the level and consistency of crop yields to be reduced and restrict the range of crops which can tolerate droughty conditions. The land classified as Grade 2 is also subject to a minor soil wetness restriction caused by clayey subsoil horizons which impede drainage. A small area of the site is classified as Subgrade 3b due to a moderate slope limitation.

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).

Table 2: Climatic and altitude data

Factor	Units	Values	
Grid reference	N/A	SU 549 064	SU 545 066
Altitude	m, AOD	32	10
Accumulated Temperature	day°C (Jan-June)	1520	1545
Average Annual Rainfall	mm	799	784
Field Capacity Days	days	160	158
Moisture Deficit, Wheat	mm	114	117
Moisture Deficit, Potatoes	mm	109	113
Overall climatic grade	N/A	Grade 1	Grade 1

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.

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 (ATO, 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 there is no overall climatic limitation. Local climatic factors, such as exposure and frost risk do not affect land quality at this location. The site is climatically Grade 1. However, climatic factors do interact with soil properties to influence soil wetness and droughtiness. At this coastal location the crop adjusted soil moisture deficits are relatively high thus increasing the likelihood of soil droughtiness. The field capacity day values are also relatively high thus increasing the effects of soil wetness.

Site

14. The site comprises a plateau on the higher land in the east, which slopes typically at an angle of 2-3 degrees towards Abbey Farm in the west of the site. A small area, adjacent to Fishers Hill in the west of the site, is limited to Subgrade 3b due to the slope being greater than 7 degrees. The site is not affected by microrelief or flooding.

Geology and soils

15. The published geological information (BGS, 1971) maps the site as predominantly London Clay, a solid deposit of the Eocene, with an area of plateau gravel underlying the higher land. This is a drift deposit of the recent and pleistocene.

16. The soils of the site are mapped as Wickham 4 Association (SSEW, 1983). 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). However, upon field inspection soils were found to be somewhat dissimilar to those described by SSEW. They are typically better drained, slightly to moderately stony and comprise coarse loamy, fine loamy, fine sandy and/or clayey textures.

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, page 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.

Grade 2

19. The site is mainly mapped as Grade 2 (very good quality) agricultural land. The land is classified due to a minor soil droughtiness limitation, which occassionally acts in combination with a minor soil wetness limitation. Pit 1 is representative of the soils within the Grade 2 mapping unit. They typically comprise fine sandy silt loam or medium clay loam topsoils which are very slightly to slightly stony (5-15% total flints, 2-5%>2cm). They overlie similar or heavy clay loam, sandy clay loam, medium sandy loam or loamy medium sand subsoils, which may be very slightly to moderately stony (up to 2-25% total flints). These typically overlie slightly stony (10-15% total flints) clay or stoneless sandy clay lower subsoils. The drainage through the profiles is slightly impeded by this poorly structured lower subsoil, as evidenced by the presence of gleying in the subsoil and also typically in the

topsoil. However, the main limitation is of soil droughtiness caused by the interaction of soil characteristics, such as textures and stone contents, with the locally dry climate. The result is a slight reduction in the amount of available water for crops so that the level and consistency of crop yields may be reduced, especially in drier years.

Subgrade 3b

20. The higher land on the site is classified as Subgrade 3b (moderate quality) agricultural land, due to a significant soil droughtiness limitation. The soils typically comprise fine sandy silt loam topsoils which are very slightly to moderately stony (5-19% total flints, 3-11%>2cm). These topsoils overlie similar or medium clay loam, sandy clay loam or medium sandy loam subsoils which become stonier with depth (41-66% total flints as described in Pit 2). Pit 2 was used to describe these soils since they were typically impenetrable to the soil auger at a depth of 40cm. The combination of soil characteristics, in particular high stone contents, and the prevailing climate at this locality cause a significant soil droughtiness limitation, which may reduce the yield and range of crops able to be grown on this land.

21. A small area of Subgrade 3b land is classified on the basis of slope, alongside Fishers Hill. The gradient (8.5-9 degrees) causes significant restrictions to the safe and efficient performance of agricultural machinery.

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SOURCES OF REFERENCE

British Geological Survey (1971) *Sheet No. 316, Fareham,* One Inch Series, 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 (1989) *Climatological Data for Agricultural Land Classification.* Met. Office: Bracknell.

Soil Survey of England and Wales (1983) *Sheet 6, South East England,* 1:250,000. SSEW: Harpenden.

Soil Survey of England and Wales (1983) *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. **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	**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. **GLEY:** 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	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	
1P	0-26	FSZL	10YR42	10YR58	C			Y	3	1	HR	8							
	26-58	MCL	25Y53	10YR58	C		00MN00	Y	3	0	HR	10	MDCSAB FR	M					+FS Porous
	58-75	HCL	25Y63	75YR58	M			Y	0	0	HR	10		M					Porous
	75-105	C	25Y63	75YR58	M			Y	0	0	HR	15		P	Y		Y		AssumeSPL
2P	0-23	FSZL	10YR33						11	3	HR	16							
	23-40	MCL	10YR43						26	5	HR	41		M					ManyRoots
	40-55	MSL	10YR44						41	15	HR	66		M					WellRooted
	55-120	MSL	10YR46						0	0	HR	62		M					QGravelRoots

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	SU545 066	PGR					1	1	70	-44	70	-39	3B				DR	2	See1P
1P	SU546 066	PGR	W	1	0	75	2	1	128	14	117	8	2				DR	2	Dug65 Auger105
2	SU546 066	PGR	W	2	0		2	1	82	-32	82	-27	3B				DR	2	See1P
2P	SU548 065	PGR	SW	2			1	1	97	-17	78	-31	3B				DR	3B	3A TSStone
3	SU547 066	PGR					1	1	60	-54	60	-49	4				DR	2	See1P
4	SU548 066	PGR	NE	3	30		2	1	154	40	116	7	2				DR	2	
5	SU547 065	PGR	S	6	28	45	3	2	150	36	110	1	2				WD	2	See1P
6	SU548 065	PGR	SW	2			1	1	70	-44	70	-39	3B				DR	3B	See2P
7	SU549 065	PGR					1	1	67	-47	67	-42	3B				DR	3B	See2P
8	SU547 064	PGR	W	2			1	1	78	-36	78	-31	3B				DR	3B	See2P
9	SU548 064	PGR					1	1	71	-43	71	-38	3B				DR	3B	See2P
10	SU549 064	PGR			0	45	3	3A	97	-17	101	-8	3A				WE	3A	

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	0-20	FSZL	10YR41						5	0	HR	15							
	20-40	FSZL	10YR54						0	0	HR	25		M					Imp Flints
2	0-30	FSZL	10YR42	10YR58	C			Y	2	0	HR	5							
	30-40	FSZL	10YR53	10YR58	C			Y	0	0	HR	10		M				Y	+2%Chalk Imp
3	0-20	FSZL	10YR41						5	0	HR	15							
	20-35	FSZL	10YR4454						0	0	HR	30		M					Imp Flints
4	0-30	FSZL	10YR42						3	0	HR	5							
	30-48	SCL	25Y6364	10YR58	C			Y	0	0	HR	2		M					FineSand
	48-60	MSL	10YR73	10YR58	C			Y	0	0		0		M					
	60-70	LMS	10YR73	10YR58	C			Y	0	0		0		M					
	70-100	MSL	10YR73	10YR58	M			Y	0	0		0		M					
	100-120	LMS	10YR73	10YR58	M			Y	0	0		0		M					
5	0-28	FSZL	10YR33						5	1	HR	15							
	28-45	SCL	10YR53	75YR56	C	D		Y	0	0	HR	5		M					MediumSand
	45-68	SC	25Y53	75YR58	M	D		Y	0	0		0		P			Y		ThickHeavy
	68-120	SCL	25Y63	10YR58	M	D		Y	0	0		0		M					+ClayLenses
6	0-30	FSZL	10YR33						8	0	HR	16							
	30-40	MCL	10YR43						0	0	HR	15		M					+MediumSand Imp
7	0-30	FSZL	10YR33						9	2	HR	19							
	30-40	MCL	10YR43						0	0	HR	20		M					Imp Gravelly
8	0-30	FSZL	10YR32						3	0	HR	5							
	30-40	MCL	10YR4333						0	0	HR	8		M					Imp Gravelly
9	0-30	FSZL	10YR32						4	0	HR	12							
	30-40	SCL	10YR43						0	0	HR	15		M					Imp Gravelly
10	0-30	MCL	10YR42	10YR46	C	D		Y	3	0	HR	8							
	30-45	MCL	10YR52	10YR46	C	D		Y	0	0	HR	10		M					Heavier
	45-80	C	25Y43	75YR46	M	D		Y	0	0	HR	10		P			Y		VeryHeavy