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Fareham Borough Local Plan Review
Site 24: WT Station, Stubbington

Agricultural Land Classification
ALC Map and Report
May 1996

Resource Planning Team
Guildford Statutory Group
ADAS Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

FAREHAM BOROUGH LOCAL PLAN REVIEW SITE 24: WT STATION, STUBBINGTON

Introduction

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 3.8 hectares of land on an old Wireless Station to the east of Burnt House Lane and north of Queens Crescent in Stubbington, near Fareham in Hampshire. The survey was carried out during March 1996.
2. The survey was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF) from its Land Use Planning Unit in Reading in connection with the Fareham Borough Local Plan Review. The results of this survey supersede any previous ALC information for this land.
3. The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group of ADAS. 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 majority of the site was in grass. The areas of the site shown as Other Land include the disused wireless station and associated concrete roadways, a partly fenced off area containing concrete blocks where the mast used to be and an overgrown impenetrable hedge towards the south west corner.

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.

Table 1: Area of grades and other land

Grade/Other Land	Area (hectares)	% Total Site Area	% Surveyed Area
2	2.2	57.9	68.8
3a	1.0	26.3	31.2
Other Land	0.6	15.8	-
<hr/>			
Total Surveyed Area	3.2		100.0
Total Site Area	3.8	100.0	

7. The fieldwork was conducted at an average density of approximately 1 boring per hectare. A total of 3 borings and one soil pit were described on the agricultural land.

8. The land at this site has been classified as Grade 2 (very good quality) and Subgrade 3a (good quality) on the basis of a soil wetness limitation with soil droughtiness being equally limiting in a number of cases.

9. The soils across the site are fairly uniform comprising medium silty clay loam topsoils and upper subsoils overlying slowly permeable heavy silty clay loam lower subsoils. The slowly permeable horizons cause drainage to be impeded such that potential land utilisation is restricted. The depth at which these horizons occur determines the severity of the soil wetness restrictions and therefore the ALC grade. These soils are also slightly restricted by soil droughtiness as, although they are comparatively water retentive, there are high crop adjusted moisture deficits and as such there is a risk of droughtiness which may affect plant growth and yield in some years.

Climate

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

12. The key climatic variables used for grading this site are given in Table 2 below and were obtained from the published 5km grid datasets using standard interpolation procedures (Met. Office, 1989).

Table 2: Climatic and altitude data

Factor	Units	Values
Grid reference	N/A	SU 558 034
Altitude	m, AOD	12
Accumulated Temperature	day°C	1543
Average Annual Rainfall	mm	780
Field Capacity Days	days	157
Moisture Deficit, Wheat	mm	117
Moisture Deficit, Potatoes	mm	114

13. 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.

14. 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.

15. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation and therefore the site is climatically Grade 1. The site is indicated by the Met. Office (1968) data as being 'Rather Exposed'. However, there was no evidence on the site or in the surrounding area that this factor is significant. The area is not considered to be

frost prone (Met. Office, 1968). The site benefits from a long growing season as indicated by the accumulated temperature values, this coupled with high light levels makes this area particularly suited to horticultural production.

Site

16. The site lies at around 12m AOD and is flat overall.

Geology and soils

17. The published geological information for the site (BGS, 1970) shows it to be underlain by a drift cover of brickearth which overlies Tertiary London Clay.

18. The most detailed published soils information for the site (SSEW, 1983 and 1984) shows the site to comprise soils of the Park Gate association. These are described as 'Deep stoneless silty soils variably affected by groundwater.' (SSEW, 1983). Soils of this broad type were found across the site.

Agricultural Land Classification

19. 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.

20. The location of the auger borings and pits is shown on the attached sample location map and details of the soils data are presented in Appendix III.

Grade 2

21. Land of very good quality extends over the majority of the site to the east and north in a single unit. Land in this area is equally limited by soil wetness and soil droughtiness.

22. Soils in this area comprise a very slightly stony (up to 5% v/v total flints), gleyed medium silty clay loam topsoil, passing to similar upper subsoil horizons. The lower subsoil (from about 70cm) comprises a stoneless, gleyed and slowly permeable (see 1p) heavy silty clay loam to depth (120cm). This slowly permeable horizon causes a drainage impedence in the profile, which in the context of the prevailing climate leads to Wetness Class II being appropriate. Grade 2 is applied after the workability status of the topsoil is taken into account. Soil wetness restricts land utilisation as damage to the structure of the soil may occur if trafficking by machinery or grazing by animals occurs under wet conditions. Although soil textures on the site are of a water retentive nature, the comparatively high crop adjusted moisture deficits mean that although the local climate is relatively moist and warm, the soils may become droughty in the drier months of some years. Soil droughtiness can affect plant growth and yield.

Subgrade 3a

23. Land of good quality has been mapped towards the south-west of the site in a single mapping unit. The principal limitation to land quality is soil wetness.

24. Soils in this area are essentially similar to those described above (see para. 22) except that the slowly permeable heavy silty clay loam lower subsoil horizons occur at a shallower depth such that these soils are appropriately placed in Wetness Class III. Subgrade 3a is applied when the topsoil workability status is taken into account. The pit observation (1p) is representative of this soil type. As above, land utilisation is potentially restricted in this area due to soil wetness but to a greater degree than the land which is classified as Grade 2.

M Larkin
Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1971) *Sheet 316, Fareham. Drift Edition. 1:63 360. Scale.* 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.

Meteorological Office (1968) *Unpublished Climate data relating to Ordnance Survey Sheet 180, 1:63,360 scale.* Met. Office: Bracknell.

Meteorological Office (1989) *Climatological Data for Agricultural Land Classification.* Met. Office: Bracknell.

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

Soil Survey of England and Wales (1984) *Soils of South East England. Bulletin No. 15.* 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 WETNESS CLASSIFICATION

Definitions of Soil Wetness Classes

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.

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.

Assessment of Wetness Class

Soils have been allocated to wetness classes by the interpretation of soil profile characteristics and climatic factors using the methodology described in *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land* (MAFF, 1988).

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

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

APPENDIX III

SOIL DATA

Contents:

Sample location map

Soil abbreviations - Explanatory Note

Soil Pit Descriptions

Soil boring descriptions (boring and horizon levels)

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

- GRID REF:** national 100 km grid square and 8 figure grid reference.
- 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		
- GRDNT:** Gradient as estimated or measured by a hand-held optical clinometer.
- GLEYSPL:** Depth in centimetres (cm) to gleying and/or slowly permeable layers.
- AP (WHEAT/POTS):** Crop-adjusted available water capacity.
- MB (WHEAT/POTS):** Moisture Balance. (Crop adjusted AP - crop adjusted MD)
- DRT:** Best grade according to soil droughtiness.
- 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		
- 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

SOIL PIT DESCRIPTION

Site Name : FAREHAM BLP STUBBINGTON Pit Number : 1P

Grid Reference: SU55700340 Average Annual Rainfall : 780 mm
 Accumulated Temperature : 1543 degree days
 Field Capacity Level : 157 days
 Land Use : Rough Grazing
 Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 27	MZCL	10YR41 00	2	7	HR	C				
27- 46	MZCL	25Y 53 52	0	2	HR	M	MDCSAB	FR	M	
46-120	HZCL	25Y 63 61	0	0		M	MDCAB	FR	M	

Wetness Grade : 3A Wetness Class : III
 Gleying : 0 cm
 SPL : 46 cm

Drought Grade : 2 APW : 156mm MBW : 39 mm
 APP : 120mm MBP : 6 mm

FINAL ALC GRADE : 3A
 MAIN LIMITATION : Wetness

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	
1	SU55800350	RGR	0	80	2	2	155	38	119	5	2			WD	2
1P	SU55700340	RGR	0	46	3	3A	156	39	120	6	2			WE	3A PIT80 AUG120
2	SU55700340	RGR	0	50	3	3A	158	41	122	8	2			WE	3A SEE 1P
3	SU55810332	RGR	0	70	2	2	158	41	122	8	2			WD	2

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	0-28	mzc1	10YR51 41	10YR56	00	C			Y	0	0	HR	5					
	28-55	mzc1	25Y 53 00	10YR66	00	M			Y	0	0	HR	5		M			
	55-80	mzc1	25Y 62 61	10YR68	00	M			Y	0	0	HR	5		M			
	80-120	hzc1	25Y 61 00	10YR68	00	M	00M000	00	Y	0	0		0		M			Y
1P	0-27	mzc1	10YR41 00	10YR46	00	C			Y	2	0	HR	7					
	27-46	mzc1	25Y 53 52	10YR66	00	M			Y	0	0	HR	2	MDCSAB	FR	M		
	46-120	hzc1	25Y 63 61	10YR68	00	M	00M000	00	Y	0	0		0	MDCAB	FR	M	Y	Y
2	0-28	mzc1	10YR41 00	10YR46	00	C			Y	0	0	HR	3					
	28-50	mzc1	10YR51 52	10YR56	00	C			Y	0	0	HR	3		M			
	50-75	hzc1	25Y 62 00	10YR58	00	M			Y	0	0		0		M			Y
	75-120	hzc1	25Y 61 00	10YR68	00	M			Y	0	0		0		M			Y
3	0-30	mzc1	10YR41 00	10YR46	00	C			Y	0	0	HR	3					
	30-50	mzc1	10YR42 52	10YR56	00	C			Y	0	0	HR	3		M			
	50-70	mzc1	25Y 53 63	10YR66	00	C			Y	0	0		0		M			
	70-120	hzc1	25Y 62 00	10YR68	00	M			Y	0	0		0		M			Y