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West Sussex Structure Plan Review
Reconnaissance Survey
Land at Shinfold
Agricultural Land Classification
September 1995

Resource Planning Team Guildford Statutory Group ADAS Reading ADAS Reference 4205/152/95 MAFF Reference EL42/768 LUPU Commission 02129

AGRICULTURAL LAND CLASSIFICATION REPORT

WEST SUSSEX STRUCTURE PLAN REVIEW LAND AT SLINFOLD

INTRODUCTION

- This summary report presents the findings of a reconnaissance Agricultural Land Classification (ALC) survey on approximately 74 ha of land at Slinfold in West Sussex The survey was carried out in September 1995
- The survey was commissioned by the Ministry of Agriculture Fisheries and Food (MAFF) Land Use Planning Unit (Reading) in connection with the West Sussex Structure Plan Review The survey was completed at a reconnaissance level of detail on a free survey basis as it was undertaken primarily to update the 1 63 360 scale provisional ALC maps for the area of search. Consequently the results are designed for strategic planning purposes only. For site specific proposals more detailed surveys may be required.
- 3 This survey supersedes any previous ALC surveys on this land
- The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group in 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
- At the time of survey the land use on the site was mainly meadow with a small amount of Set Aside land in the south east. Lower Lodge Farm has been shown as Urban at this mapping scale though it does include a number of farm buildings. Land to the north of the farm is used as a shooting range but this has been mapped as agricultural as it still comprises mainly permanent grassland.

SUMMARY

- The findings of the survey are shown on the enclosed ALC map The map has been drawn at a scale of 1 50 000 it is accurate at this scale but any enlargement would be misleading
- 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			
3b	73 0	98 3			
Urban	13	17			
Not surveyed	0	N/A			
Total survey area	74 3	100			
Total site area	74 3	N/A			

- The fieldwork was conducted at an average density of approximately 1 boring per 7 hectares A total of 11 borings and 1 soil inspection pit were described
- The entire site has been classified as Subgrade 3b moderate quality land, on the basis of a severe soil wetness limitation. The soils are derived from the Weald Clay and as such comprise poorly drained clayey soils with slowly permeable upper subsoils.

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
- 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	TQ 097 301
Altitude	m AOD	60
Accumulated Temperature	day°C	1465
Average Annual Rainfall	mm	771
Field Capacity Days	days	162
Moisture Deficit Wheat	mm	110
Moisture Deficit Potatoes	mm	104

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

- 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
- The combination of rainfall and temperature at this site mean that there is no overall climatic limitation (Climate Grade 1). However climatic factors can interact with soil properties to influence soil wetness and droughtiness limitations. At this locality the crop adjusted soil moisture deficits are slightly high therefore increasing the likelihood of soil droughtiness.
- 15 Local climatic factors such as exposure or frost risk are not believed to affect the site

Site

- The site slopes gently from 40m AOD in the north to 70m AOD in the south therefore altitude and relief impose no restrictions to agriculture land use
- 17 Flooding does not appear to be limiting on this site either

Geology and soils

- 18 The relevant geological sheets (BGS 1972 & 1981) map the entire site as Weald Clay
- The most recently published soil information for the site (SSEW 1983) shows the Wickham 1 soil association across all of the site. These soils are described as Slowly permeable seasonally waterlogged fine silty over clayey fine loamy over clayey and clayey soils (SSEW 1983). Detailed field survey broadly confirms this

AGRICULTURAL LAND CLASSIFICATION

- 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 2
- 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 III

Subgrade 3b

All of the agricultural land on this site has been classified as Subgrade 3b (moderate quality) Soil inspection pit 1 is typical of the profiles on this site comprising heavy clay loam topsoils over poorly structured slowly permeable clay from 24cm depth. Manganese concretions and gleying are present throughout the profile. In this climatic regime the land has been assessed as being consistent with Wetness Class IV as the shallow slowly permeable horizons significantly impede drainage resulting in prolonged waterlogging of the soil profile. As a result crop germination and growth may be adversely affected. Heavy topsoil textures

can also limit the timing of cultivations as trafficking by agricultural machinery or grazing by livestock may lead to structural damage

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SOURCES OF REFERENCE

British Geological Survey (1972) Sheet No 301 Haslemere 1 50 000 scale (Solid & Drift Edition) BGS London

British Geological Survey (1980) Sheet No 302 Horsham 1 63360 scale (Solid & 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 Soils of South East England 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

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

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 l								
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								
Ш	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

- 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	eLEY	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 Crop	os			

- 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		<u>-</u>		

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

ОC	Overall Climate	\mathbf{AE}	Aspect	$\mathbf{E}\mathbf{X}$	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 Stonine	SS			

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	\mathbf{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

- 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 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 fnable FR fnable 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 WEST SUSSEX SP SLINFOLD Pit Number 1P

Grid Reference TQ10863014 Average Annual Rainfall 771 mm

Accumulated Temperature 1465 degree days

Field Capacity Level 162 days

Land Use Permanent Grass Slope and Aspect degrees

Slope and Aspect degree

STONES >2 TOT STONE LITH MOTTLES STRUCTURE CONSIST SUBSTRUCTURE CALC HORIZON COLOUR TEXTURE 0 24 HCL 10YR53 00 0 7 С 24- 55 С 05Y 62 00 0 0 М MDCPR Р VM

Wetness Grade 3B Wetness Class IV

Gleying 0 cm SPL 024 cm

Drought Grade 3B APW 80 mm MBW 30 mm

APP 83 mm MBP 21 mm

FINAL ALC GRADE 3B
MAIN LIMITATION Wetness

program ALC012

LIST OF BORINGS HEADERS 26/10/95 WEST SUSSEX SP SLINFOLD

page 1

SAMPI	LE	۵	ASPECT				WET	NESS	WH	HEAT	Pſ	OTS	М	1 REL	EROSN	FROST	CHEM	ALC	: 1
МО	GRID REF	USE		GRDNT	GLEY	SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EX	P DIST	T LIMIT		COMMENTS
1	TQ10103047	PGR			0 0	025	4	3B		0		0					WE	38	•
1P	TQ10863014				0 0		4	3B	80	30	83	21	38				WE	3B	
2	TQ10473055	PGR	N	03	0 0	J25	4	3B		0		0					WE	3B	•
3	TQ10773065	PGR	NE	02	0 0	J28	4	3B		0		0					WE	3B	Hard & Dry
4	TQ10993055	PGR	NE	02	0 0)20	4	3B		0		0					WE	3B	
5	TQ10353022	PGR	NW	03	0 0	025	4	3B		0		0					WE	3B	•
6	TQ10703032			**	0 0		4	3B		0		0					WE	3B	Hard at 50cm
7	TQ10863014	PGR	NE	02	0 0	J25	4	3B		0		0					WE	3B	1
8	TQ11183014	PGR	N	02	0 0	J20	4	3B		0		0					WE	3B	
9	TQ11302989	PGR	SW		0 0	J28	4	38		0		0					WE	38	f
10	TQ10952971	PGR	SW	02	0 0)20	4	3B		0		0					WE	3B	=
11	TQ11162950	STB	SW		0 0)25	4	3B		0		0					WE	3B	1

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-MOTTLES PED STONES STRUCT/ SUBS IPLE DEPTH TEXTURE COLOUR COL ABUN CONT COL GLEY >2 >6 LITH TOT CONSIST STR POR IMP SPL CALC 0 25 10YR53 00 10YR56 51 C 00MN00 00 Y 0 0 hc1 0 Almost Clay 25 45 10YR53 00 10YR68 52 M С Υ 0 0 0 γ 45-60 10YR52 00 75YR68 61 M Y 0 0 Υ 0 24 hc1 10YR53 00 10YR58 51 C 00MN00 00 Y 0 0 HR 1 24-55 c 05Y 62 00 10YR68 71 M 00MN00 00 Y 0 0 0 MDCPR VM P Y 0-25 hc1 10YR53 00 10YR56 61 C 00MN00 00 Y 0 0 0 Almost Clay 25 48 10YR63 00 10YR68 00 M 00MN00 00 Y 0 0 48 65 c 05Y 53 00 25Y 68 51 M 00MN00 00 Y 0 0 0-28 10YR53 00 75YR58 00 C mc1 Y 0 0 HR 2 28 60 25Y 61 71 10YR58 00 M 00MN00 00 Y 0 0 C 0 0 20 10YR53 00 10YR58 00 C hc1 Y 0 0 HR 2 20-60 25Y 61 71 75YR58 00 M 00MN00 00 Y 0 0 0 0-25 mc1 10YR53 00 10YR56 00 C 0 0 25 48 10YR53 00 10YR56 68 M 00MN00 00 Y C 0 0 Ρ 48-70 10YR53 00 10YR71 68 M 00MN00 00 Y 0 0 0 0-25 hzc1 10YR52 00 75YR58 00 C Y 0 0 HR 25 50 С 25Y 71 61 75YR68 00 M 0 0 0 0 25 hc1 10YR53 00 10YR58 00 C 0 0 HR Υ 2 25 60 С 05Y 62 00 75YR68 00 M 0 ٧ 0 20 hcl 10YR53 00 75YR68 00 M 00MN00 00 Y 0 0 20 55 25Y 62 00 75YR68 56 M 00MN00 00 Y 0 0 0 Υ 0 28 hc1 10YR53 00 10YR58 00 C Y 0 0 HR 2 28 40 05Y 62 00 75YR58 00 M 0 0 0 40 60 05Y 52 00 75YR58 00 M 00MN00 00 Y 0 0 0 0 20 hc1 10YR53 00 10YR58 00 C 0 0 HR 20 60 25Y 61 71 75YR58 00 M 0 25 hc1 10YR52 00 05Y 46 00 C γ 0 0 HR 2 25 45 05Y 62 00 75YR58 00 M С Υ 0 0 0 Y 0 0 45 60 c 05Y 52 00 10YR58 00 M Ω