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ARUN DISTRICT LOCAL PLAN
SITE 32 LAND WEST OF
BILSHAM ROAD YAPTON
AGRICULTURAL LAND CLASSIFICATION
ALC MAP AND REPORT
APRIL 1994

ARUN DISTRICT LOCAL PLAN
SITE 32 LAND WEST OF BILSHAM ROAD YAPTON
AGRICULTURAL LAND CLASSIFICATION REPORT

1 0 Summary

1 1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality on a number of sites in the Arun District of West Sussex The work forms part of MAFF's statutory input to the preparation of the Arun District Local Plan

1 2 Site 32 comprises approximately 1 hectare of land west of Bilsham Road at Yapton in West Sussex An Agricultural Land Classification (ALC) survey was carried out during April 1994 The survey was undertaken at a detailed level of approximately three borings per hectare A total of three soil auger borings and one soil inspection pit were described 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 Work was conducted by members of the Resource Planning Team in the Guildford Statutory Group

1 4 At the time of the survey the land on the site was under a recently re seeded grass ley

1 5 The distribution of grades and subgrades is shown on the ALC map and the areas are given in the table below The map has been drawn at a scale of 1 5 000 It is accurate at this scale but any enlargement would be misleading This map supersedes any previous information for this site

Table 1 _ Distribution of Grades and Subgrades

Grade	Area (ha)	% of Agricultural Area
2	0 8	61 53
3a	0 5	38 47
Total area of site	1 3	100 0

1 6 Appendix 1 gives a general description of the grades subgrades and land use categories identified in the survey 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 agricultural land on the site has been classified as Grade 2 and Subgrade 3a with soil droughtiness and wetness as the main limitations In the north-east of the site soil profiles typically comprise slightly stony silty clay loams that become heavier with depth These profiles show a slight restriction on the profile available water for plant growth On the remainder of the site soil profiles typically comprise medium silty clay loam topsoils that become heavier with depth overlying a poorly structured slowly permeable clay lower subsoil The depth at which the slowly permeable layer is encountered varies this being reflected in the presence of Grade 2 and Subgrade 3a land showing a wetness limitation Poorly drained soils can restrict plant growth and are more susceptible to damage from grazing livestock and agricultural machinery

2 0 Climate

2 1 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

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 (degree days 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 below and these show that there is no overall climatic limitation affecting the site

2 4 No local climatic factors such as exposure or frost risk affect the site However climatic factors do interact with soil factors to influence soil wetness and droughtiness limitations The Field Capacity Days are relatively low in a regional context thus the likelihood of any severe wetness limitation is decreased Moisture deficits are correspondingly high therefore the likelihood of a soil droughtiness limitation is increased

Table 2 _ Climatic Interpolation

Grid Reference	SU 976 028
Altitude (m)	4
Accumulated Temperature (days)	1544
Average Annual Rainfall (mm)	748
Field Capacity (days)	153
Moisture Deficit Wheat (mm)	120
Moisture Deficit Potatoes (mm)	117

3 0 Relief

3 1 The site is flat and lies at an altitude of 4 metres On no part of the site do altitude or relief pose any limitation to agricultural use

4 0 Geology and Soil

4 1 The published geology map for the site area (BGS 1975 Sheet 332 (Drift) Bognor) shows the underlying geology to be brickearth over Upper Chalk

4 2 The published soils information for the site area (SSGB 1967 Sheet SU 90 Bognor Regis) shows the soils mapped as two distinct series The majority of the site comprises soils of the Park Gate series (shallow and deep phases) These are described as 'deep stoneless silty soils affected by seasonally high groundwater' (SSEW 1983) The shallow phase with a calcareous clay horizon runs in a band along the south eastern half of the site the deep phase running along the opposite side A small area of soils of the Hook series occurs in the south-western corner of the site These are described as 'deep brown earths with gleying' (SSEW 1983) Detailed field examination broadly confirms this particularly the presence of heavier textured horizons at shallow depths in the south-eastern half of the site

5 0 Agricultural Land Classification

5 1 Table 1 provides the details of the area measurements for each grade and the distribution of each grade is shown on the attached ALC map

5 2 The location of the soil observation points are shown on the attached sample point map

5 3 Grade 2 The majority of the agricultural land on the site has been classified as Grade 2 very good quality land with soil wetness and droughtiness as the main limitations Soil profiles showing a wetness limitation comprise a stoneless medium silty clay loam topsoil overlying a similar textured upper subsoil Profiles become more heavily textured below 40cm the lower subsoils consisting of a heavy silty clay loam resting upon a slowly permeable clay horizon which commences at 70cm The soil profile is gleyed below the topsoil suggesting the existence of a soil wetness problem These drainage characteristics equate these soils to Wetness Class II which in combination with the easily worked topsoils and the local climatic regime gives a resultant classification of Grade 2 In the south western corner of the site subsoil textures are lighter showing no evidence of any wetness limitation However a combination of soil texture and the slightly stony nature of the profile along with the local climatic regime means that there is a slight restriction on the amount of profile available water for plant growth Consequently this may have an effect upon crop yields and accordingly a classification of Grade 2 due to droughtiness is appropriate

5 4 Subgrade 3a Land of this quality occurs in the south eastern half of the site showing a wetness imperfection evidenced by gleying from the topsoil Soil profiles typically comprise a medium silty clay loam topsoil a heavy silty clay loam upper subsoil resting upon a clay lower subsoil commencing at approximately 53cm A soil inspection pit (Pit 1) proved that the clay lower subsoil has a poor substructural condition and low porosity thereby satisfying the criteria for classification as a slowly permeable layer These drainage characteristics particularly the comparatively shallow depth to the slowly permeable clay means that these soils are assigned to Wetness Class III In combination with the topsoil texture and the local climatic regime this gives a resultant classification of Subgrade 3a Soils suffering from poor drainage with slowly permeable subsoils restrict plant growth and development and may be more susceptible to structural damage due to poaching by grazing livestock or trafficking by agricultural machinery

ADAS Ref 4202/086/94
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Resource Planning Team
Guildford Statutory Group
ADAS Reading

REFERENCES

* British Geological Survey (1975) Sheet No 332 (Drift) Bognor 1 50 000

* 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 Classifica tion

* Soil Survey of Great Britain (1967) Bulletin 3 Soils of the West Sussex Coastal Plain

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

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

Urban

Built up or 'hard' uses with relatively little potential for a return to agriculture including housing industry commerce education transport religous buildings cemetries 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

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 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				

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	**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)

SOIL PIT DESCRIPTION

Site Name ARUN LP SITE 32 Pit Number 1P

Grid Reference SU97620273 Average Annual Rainfall 748 mm
Accumulated Temperature 1544 degree days
Field Capacity Level 153 days
Land Use Ley
Slope and Aspect degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	MOTTLES	STRUCTURE
0- 27	MZCL	10YR42 00	0	2	C	
27- 53	HZCL	10YR53 00	0	0	M	MDCSAB
53- 70	C	10YR52 00	0	0	M	WKCSAB

Wetness Grade 3A Wetness Class III
Gleying 0 cm
SPL 053 cm

Drought Grade APW mm MBW 0 mm
APP mm MBP 0 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	SU97600280	LEY	030	075		2	2		0		0						WE	2	
1P	SU97620273	LEY	0	053		3	3A		0		0						WE	3A	
2	SU97570270	LEY				1	1	159	39	124	7	2					DR	2	
3	SU97620273	LEY	027	045		3	3A		0		0						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	0-30	mzcl	10YR52 00						0	0		0						
	30 40	mzcl	10YR53 00	10YR58	61	C		Y	0	0		0		M				
	40-75	hzcl	10YR52 00	10YR58	61	M		Y	0	0		0		M				
	75-100	c	10YR62 00	10YR68	71	M		Y	0	0		0		P			Y	
1P	0-27	mzcl	10YR42 00	10YR58	00	C		Y	0	0	HR	2						
	27-53	hzcl	10YR53 00	10YR58	61	M		Y	0	0		0	MDCSAB	FM M				
	53-70	c	10YR52 00	10YR58	61	M	00MN00	00 Y	0	0		0	WKCSAB	FM P			Y	
2	0-32	mzcl	10YR52 00						0	0	HR	2						
	32-70	hzcl	75YR54 00						0	0		0		M				
	70-80	hzcl	10YR72 00						0	0	CH	5		M				
	80-120	mzcl	10YR64 00						0	0	CH	8		M				
3	0-27	mzcl	10YR42 00	10YR58	00	F			0	0	HR	2						
	27-45	hzcl	10YR53 00	10YR58	61	C		Y	0	0		0		M				
	45 90	c	10YR52 00	10YR58	61	M	00MN00	00 Y	0	0		0		P	Y		Y	