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Arun District Local Plan

Site 24 Findon

Agricultural Land Classification

ALC Map and Report

April 1994

AGRICULTURAL LAND CLASSIFICATION REPORT

ARUN DISTRICT LOCAL PLAN
SITE 24 LAND ADJOINING THE QUADRANGLE, FINDON

1 Summary

1 1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality for 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 24 comprises 3 hectares of land adjoining The Quadrangle Findon West Sussex An Agricultural Land Classification (ALC) survey was carried out during April 1994 The survey was undertaken at a detailed level of approximately two borings per hectare A total of 7 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 a long term limitation on its use for agriculture

1 3 At the time of the survey the site was in permanent pasture A small area of stables is denoted as agricultural buildings

1 4 The distribution of grades and subgrades is shown on the attached ALC map and the areas and extent 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

Table 1 Distribution of Grades and Subgrades

Grade	Area (ha)	% of Agricultural Land
3a	1 4	50 0
3b	1 4	50 0
Agricultural Buildings	0 1	100 0 (2 8 ha)
Total area of site	2 9	

1 5 Appendix I 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 6 The site has been classified as Subgrades 3a (good quality land) and 3b (moderate quality land) The well drained calcareous soils are derived from Chalk and

associated flinty drift deposits The key limitations are topsoil stone content and droughtiness The small field to the extreme north of the site is believed to have been subject to disturbance mainly in the form of soil tipping Land graded 3b is principally limited by high topsoil stone contents (15-35% v/v flints > 2 cm) which will adversely affect crop growth and yields and significantly increase implement and tyre wear Towards the south west corner of the site shallow soils over chalk are also included in this mapping unit due to droughtiness as are disturbed soils towards the north Land graded 3a comprises deep soils over chalk with a lower (10-15% v/v > 2 cm) topsoil stone content than similar soils Graded 3b

2 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 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 affecting land quality However climatic factors do interact with soil properties to influence soil wetness and droughtiness limitations

Table 2 Climatic Interpolation

Grid Reference	TQ123079
Altitude(m AOD)	46
Accumulated Temperature (°days Jan June)	1490
Average Annual Rainfall (mm)	841
Field Capacity Days	174
Moisture deficit wheat (mm)	110
Moisture deficit potatoes (mm)	104
Overall Climatic Grade	1

3 Relief

3 1 The site comprises part of the lower slopes of a dry chalk valley running approximately north to south The land rises gently towards the western and southwestern boundaries of the site having an average altitude of about 46m AOD Nowhere on the site do gradient or microrelief pose a limitation in terms of agricultural land quality

4 Geology and Soils

4 1 The published geology map for the site area (BGS Sheet 318/333 1978) shows the site to be underlain by head deposits

4 2 The published soils information for the area (SSEW 1983 Sheet 6 1 250 000) shows the site to comprise the Coombe 1 association described as calcareous fine silty soils deep in valley bottoms shallow to chalk on valley sides in places'

5 Agricultural Land Classification

5 1 The ALC classification of the site is shown on the attached ALC map

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

Subgrade 3a

5 3 Land classified as subgrade 3a (good quality land) occurs towards the west of the area and is associated with gently sloping land Soils are comparitively deep over chalk (see pit 6p) comprising flinty calcareous medium silty clay loam upper horizons passing to flinty heavy silty clay loams lower horizons below about 40cm These soils are well drained (wetness class 1) but are limited by a topsoil stone content of 10%-15% (by volume) of flints >2cm in size High stone contents impair the effeciency of mechanised operations leading to poorer germination and growth of crops as well as increased implement and tyre wear

Subgrade 3b

5 4 Moderate quality (subgrade 3b) land is mapped over the remainder of the area Firstly it is associated with similar soils to those described above but with a higher content of flints Such land occurs on the lower slopes adjoining the eastern side of the site where it bounds properties in 'The Quadrangle In this locality high topsoil stone contents of 30% 35% (by volume) of flints >2cm in size were assessed in a calcareous topsoil matrix of medium silty clay loam This will adversely affect crop growth and yields and significantly increase implement and tyre wear

5 5 Subgrade 3b land is also associated with shallow soils over chalk Such soils occur in the extreme southwestern corner of the site and comprise calcareous medium silty clay loam topsoils passing to soft white chalk at 25-30cm The key limitation is soil droughtiness the soil profile having an available water capacity which is inadequate to meet crop requirements in most years

5 6 Also included in the subgrade 3b mapping unit is a limited area of disturbed ground believed to be confined to the small field at the extreme north of the site It is understood from the owner that soil materials from a road improvement scheme were deposited in this area Where sampled the soils comprised medium silty clay loam upper horizons passing to lower horizons containing a proportion of rubbly materials

ADAS Ref 4202/079/94
MAFF Ref EL42/460

Resource Planning Team
Guildford Statutory Group
ADAS Reading

REFERENCES

British Geological Survey (1978) Sheet Number 318/333 Brighton and Worthing 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 Classification

Soil Survey of England and Wales (1983) Sheet Number 6 Soils of Southeast England 1 250 000

Soil Survey of England and Wales (1984) Soils and their Use in Southeast England Bulletin Number 15

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

DEFINITION OF SOIL WETNESS CLASS

Wetness Class I

The soil profile is not wet within 70 cm depth for more than 30 days in most years

Wetness Class 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 180 days but only wet within 40 cm depth for 31-90 days in most years

Wetness Class 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

Wetness Class IV

The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth fro 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

Wetness Class V

The soil profile is wet within 40 cm depth for 211-335 days in most years

Wetness Class VI

The soil profile is wet within 40 cm depth for more than 335 days in most 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 database This has commonly used notations and abbreviations as set out below

Boring Header Information

1 **GRID REF** national 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 measured by a hand held optical clinometer

4 **GLEY/SPL** Depth in cm to gleying or slowly permeable layers

5 **AP (WHEAT/POTS)** Crop-adjusted available water capacity

6 **MB (WHEAT/POTS)** Moisture Balance

7 **DRT** Best grade according to soil droughtiness

8 If any of the following factors are considered significant an entry of 'Y' will be entered in the relevant column

MREL Microrelief limitation	**FLOOD** Flood risk	**EROSN** Soil erosion risk
EXP Exposure limitation	**FROST** Frost	**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	**ST** Topsoil Stones
CH Chemical	**WE** Wetness	**WK** Workability	
DR Drought	**ER** Erosion Risk	**WD** Soil Wetness/Droughtiness	

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	**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 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

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

6 **STONE LITH** One of the following is used

HR all hard rocks and stones
CH chalk
ZR soft argillaceous or silty rocks
MSST soft medium grained sandstone
SI soft weathered igneous/metamorphic rock
SLST soft oolitic or dolimitic limestone
FSST soft fine grained sandstone
GH gravel with non-porous (hard) stones
GH gravel with non porous (hard) stones
Stone contents (>2cm >6cm and total) are given in percentages (by volume)

7 **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

8 **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

9 **SUBS STR** Subsoil structural condition recorded for the purpose of calculating profile droughtiness **G** good **M** moderate **P** poor

10 **POR** Soil porosity If a soil horizon has less than 0 5% biopores >0 5 mm a 'Y' will appear in this column

11 **IMP** If the profile is impenetrable a 'Y' will appear in this column at the appropiate horizon

12 **SPL** Slowly permeable layer If the soil horizon is slowly permeable a 'Y' will appear in this column

13 **CALC** If the soil horizon is calcareous a 'Y' will appear in this column

14 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 ARUN SITE 24 FINDON Pit Number 6P

Grid Reference TQ12280775

Average Annual Rainfall	841 mm
Accumulated Temperature	1490 degree days
Field Capacity Level	174 days
Land Use	Permanent Grass
Slope and Aspect	01 degrees E

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 20	MZCL	10YR33 00	14	15	HR					Y
20- 40	MZCL	10YR42 00	0	10	HR		MDMSAB	FR	G	Y
40-100	HZCL	10YR34 00	10	10	HR		MDCSAB	FR	M	Y
100 120	CH	22XX22 00	0	0					P	Y

Wetness Grade 1

Wetness Class	I
Gleying	000 cm
SPL	No SPL

Drought Grade 1

APW	145mm	MBW	35 mm
APP	117mm	MBP	13 mm

FINAL ALC GRADE 3A

MAIN LIMITATION Topsoil Stoniness

SAMPLE NO	GRID REF	USE	ASPECT	GRDNT	GLEY	SPL	WETNESS CLASS	WETNESS GRADE	WHEAT AP	WHEAT MB	POTS AP	POTS MB	M REL DRT	EROSN FLOOD	FROST EXP	CHEM DIST	ALC LIMIT	ALC	COMMENTS
1	TQ12270801	PGR			000		1	1	000	0	000	0	3A			Y	DR	3A	see p 6p
1A	TQ12300799	PGR	E	01	000				000	0	000	0				Y		3B	IMP 20
1B	TQ12250800	PGR	E	01	000				000	0	000	0				Y		3B	IMP 40
2	TQ12300795	PGR	E	02	000		1	1	000	0	000	0					ST	3B	
3	TQ12250787	PGR	E	02	000		1	1	000	0	000	0					DR	3A	see pit 6p ts
4	TQ12280775	PGR	E	03	000		1	1	086	-24	092	-12	3B				DR	3B	
5	TQ12340782	PGR	E	02	000		1	1	107	-3	083	-21	3A				TS	3B	TS DR
6P	TQ12280775	PGR	E	01	000		1	1	145	35	117	13	1				TS	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	10YR33 00						0	0	HR	15						Y	
	30 55	mzcl	10YR33 00						0	0	HR	10		M				Y	
	55 65	mzcl	10YR43 00						0	0	HR	10		M				Y	IMP 65+
1A	0-20	mzcl	22XX22 00						0	0		0						Y	IMP 20+ DISTURBED
1B	0-25	mzcl	10YR42 00						10	0	HR	10						Y	DISTURBED
	25-40	mzcl	22XX22 00						0	0	HR	10						Y	IMP 40+
2	0 20	mzcl	10YR33 00						35	15	HR	40						Y	RIDDLED
	20 40	mzcl	10YR44 00						0	0	HR	40						Y	
3	0 25	mzcl	10YR33 00						0	0	HR	15						Y	
	25 40	mzcl	10YR43 00						0	0		10		M				Y	
	40-50	hzcl	10YR43 00						0	0		10		M				Y	IMP 50+
4	0 20	mzcl	10YR42 00						0	0		0						Y	
	20 30	mzcl	10YR42 00						0	0	CH	50		M				Y	
	30 70	ch	22XX22 00						0	0		0		P				Y	
5	0 25	mzcl	10YR42 00						30	15	HR	35						Y	RIDDLED
	25 120	mzcl	10YR43 44						0	0	HR	35		M				Y	CHALKY
6P	0 20	mzcl	10YR33 00						14	7	HR	15						Y	RIDDLED
	20 40	mzcl	10YR42 00						0	0	HR	10	MDMSAB	FR	G			Y	RIDDLED
	40 100	hzcl	10YR34 00						10	8	HR	10	MDCSAB	FR	M	Y		Y	RIDDLED
	100-120	ch	22XX22 00						0	0		0		P				Y	