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Arun District Local Plan
Site 7 : Land South of Rustington By-Pass
Agricultural Land Classification
ALC Map and Report
April 1994

AGRICULTURAL LAND CLASSIFICATION REPORT

ARUN DISTRICT LOCAL PLAN
SITE 7 : LAND SOUTH OF RUSTINGTON BY-PASS

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 7 comprises 11.6 hectares of land lying south of the A259 Rustington By-Pass and north of the railway at Rustington, West Sussex. The eastern half of the site had previously been surveyed in November 1988. More recent survey work, undertaken in March 1994, completes the detailed grading for the remainder of the site. A total of 13 borings and two soil inspection pits have been made. These 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 recent survey the eastern part of the site was in set-aside, whilst much of the remainder was in grass.

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
1	4.4	42.3
2	2.3	22.1
3a	0.6	5.8
3b	3.1	29.8 (10.4 ha)
Urban	0.9	
Non-Agricultural	0.1	
Not Surveyed	0.2	
Total	11.6	

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 area surveyed has been classified as Grades 1 and 2 with smaller areas of Grades 3a and 3b. The higher quality Grade 1 and 2 land is associated with deep well drained silt loam and silty clay loam soils developed in brickearth deposits. Land assigned to Grade 1 has no or very minor limitations to agricultural use, whilst land mapped as Grade 2 has a slight droughtiness restriction. The lower quality 3b land is associated with poorly drained alluvial soils whilst the Grade 3a is intermediate between these and the brickearth deposits having a moderate wetness limitation.

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 limitaion in terms of agricultural land quality. However climatic factors do interact with soil properties to influence soil wetness and droughtiness limitations.

Table 2 :Climatic Interpolation

Grid Reference	TQ049036	TQ056032
Altitude (m, AOD)	5	5
Accumulated Temperature (°days, Jan-June)	1541	1541
Average Annual Rainfall (mm)	747	744
Field Capacity Days	154	154
Moisture deficit, wheat (mm)	121	121
Moisture deficit, potatoes (mm)	118	119
Overall Climatic Grade	1	1

3. Relief

3.1 The site occupies a small valley feature running northeast towards lower lying land beyond. The higher land lies at approximately 5m AOD, falling to around 2m AOD in the valley bottom where the ditch passes under the A259 Rustington By-Pass. Nowhere on the site does gradient or microrelief affect land quality.

4. Geology and Soils

4.1 The published geology map for the site area, (BGS Sheet 317,1972) shows the site to be underlain by brickearth deposits on the higher ground, with alluvium mapped on the lower ground associated with the lower slopes of the valley feature.

4.2 The published soils information for the area (SSEW 1967, Sheet TQ00/TQ10, 1:25,000) shows the site to comprisea number of soil types. The Arundel Complex, ground water gley soils associated with esturine alluvium, is mapped on lower land with soils derived from loamy drift (Calcetto and Lyminster series) predominating elsewhere. The Hamble Series, which is derived from silty brickearth deposits, is mapped on the higher ground to the east and west of the site.

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.

Grade 1

5.3 Excellent quality (grade 1) land occurs towards the eastern half of this site. It comprises deep well drained (wetness class 1) soils derived from brickearth deposits. The soils typically comprise very slightly stony, non-calcareous silt loam topsoils resting over similar or slightly heavier medium silty clay loam upper subsoils. These rest over medium or heavy silty clay loam lower horizons to depths in excess of 120cm. Such land has no significant limitations to agricultural use and is suitable for a very wide range of agricultural and horticultural cropping.

Grade 2

5.4 Very good quality grade 2 land is mapped towards the western end of the site. The deep well drained soils are similar to those described for grade 1 areas but textures tend to be slightly finer giving rise to medium silty clay topsoils and upper subsoils resting over heavy clay loam and clay lower horizons. In a coastal areas such as this which has comparatively high moisture deficits, land of this type is graded 2 on the basis of a minor droughtiness limitation. This will act to slightly reduce crop yields, but nevertheless a wide range of agricultural and horticultural crops can be grown.

Subgrade 3a

5.5 Land mapped as subgrade 3a occurs in a small block towards the centre of the site. This is part of a larger area of grade 3a land mapped as part of the more extensive 1988 survey which covers the eastern part of this site as well as substantial areas to the north of the by-pass. The 1988 survey report (ADAS Ref.4202/50/88) indicates these soils to be fine sandy silt loams overlying slowly permeable fine sandy clay subsoils. Such soils are allocated to wetness class IV but as a result of their workable topsoils are appropriately graded 3a, the key limitation being one of soil wetness.

Subgrade 3b

5.6 Moderate quality (subgrade 3b) land is mapped on lower land adjoining the ditch running northeastwards out of the site. Soils typically comprise medium silty clay loam or silt loam topsoils overlying heavily gleyed and slowly permeable clays or silty clays. These poorly drained (wetness class IV) soils have significant wetness and workability limitations restricting the flexibility for cropping and stocking.

ADAS Reference : 4202/057/94
MAFF Reference : EL 42/460

Resource Planning Team
Guildford Statutory Group
ADAS Reading

REFERENCES

British Geological Survey (1972), Sheet Number 317, Chichester, 1:63360.

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 (1967), Sheet Number TQ00/TQ10, Soils of The West Sussex Coastal Plain, 1:25,000.

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 (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 (e.g. 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, e.g. 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 : SITE7 ARUN LP RUSTINGTON Pit Number : 1P

Grid Reference: TQ04860359
Average Annual Rainfall : 747 mm
Accumulated Temperature : 1541 degree days
Field Capacity Level : 154 days
Land Use : Permanent Grass
Slope and Aspect : 01 degrees N

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 30	MZCL	10YR42 43	0	0		
30- 50	MZCL	10YR54 00	0	0		MDCSAB
50- 75	HCL	10YR56 00	0	0		MDCSAB
75-120	C	10YR56 00	0	0		MDCSAB

Wetness Grade : 1
Wetness Class : I
Gleying :000 cm
SPL : No SPL

Drought Grade : 2
APW : 152mm MBW : 31 mm
APP : 123mm MBP : 4 mm

FINAL ALC GRADE : 2
MAIN LIMITATION : Droughtiness

SOIL PIT DESCRIPTION

Site Name : ARUN LP SITE 7 Pit Number : 2P

Grid Reference: TQ05220339 Average Annual Rainfall : 744 mm
Accumulated Temperature : 1541 degree days
Field Capacity Level : 154 days
Land Use :
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 32	MZCL	10YR42 00	0	0						
32- 50	HZCL	10YR42 00	0	0		C	CAB			

Wetness Grade : 3B Wetness Class : IV
Gleying :032 cm
SPL :032 cm

Drought Grade : APW : 000mm MBW : 0 mm
APP : 000mm MBP : 0 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Wetness

SAMPLE NO.	GRID REF	ASPECT USE		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	TQ04760365	PGR	N	01	080		1	1	158	37	119	0	2				DR	2	
1P	TQ04860359	PGR	N	01	000		1	1	152	31	123	4	2				DR	2	BORDER 1
2	TQ04850361	PGR	N	01	000		1	1	152	31	123	4	2				DR	2	BORDER 1
2P	TQ05220339				032	032	4	3B	000	0	000	0					WE	3B	
3	TQ04930357	PGR	N	01	000		1	1	149	28	123	4	2				DR	2	BORDER 1
4	TQ05010356	PGR	N	01	000	045	3	3A	000	0	000	0		Y			WE	3A	Q SPL 45
5	TQ05060350	PGR	N	01	000	030	4	3B	000	0	000	0		Y			WE	3B	
6	TQ05100353				035	035	4	3B	000	0	000	0					WE	3B	Q FLOOD
7	*TQ05200340*				*032*	*045*	3	3A	*000*	*0*	*000*	*0*					WE	3A	Q WC4 3B
8	TQ05300340				000		1	1	138	17	142	23	2					1	AP-SEE B10/11
9	TQ05400330				000		1	1	148	27	153	34	2					1	AP-SEE B10/11
10	TQ05500330				000		1	1	176	55	140	21	1					1	
11	TQ05500320				000		1	1	182	61	145	26	1					1	
12	TQ05600320				000		1	1	138	17	140	21	2					1	AP SEE B10/11
13	TQ05320333				035	060	3	3A	000	0	000	0					WE	3A	

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC
	0-25	mzcl	10YR43 00						0	0		0						
	25-50	mzcl	10YR44 00						0	0		0		M				
	50-60	hcl	10YR44 00						0	0	HR	15		M				
	60-80	c	10YR54 00						0	0	HR	5		M				
	80-120	msl	10YR53 56	75YR58 00		C		Y	0	0		0		M				
1P	0-30	mzcl	10YR42 43						0	0		0						
	30-50	mzcl	10YR54 00						0	0		0	MDCSAB	FR M				
	50-75	hcl	10YR56 00						0	0		0	MDCSAB	FR M				
	75-120	c	10YR56 00						0	0		0	MDCSAB	FR M				MN CONCS
2	0-30	mzcl	10YR42 43						0	0		0						
	30-50	mzcl	10YR54 00						0	0		0		M				
	50-75	hcl	10YR56 00						0	0		0		M				
	75-120	c	10YR56 00						0	0		0		M				
2P	0-32	mzcl	10YR42 00						0	0		0						
	32-50	hzcl	10YR42 00	75YR46 00		C		Y	0	0		0	CAB			Y		
3	0-30	mzcl	10YR42 00						0	0		0						
	30-50	mzcl	10YR43 00						0	0		0		M				
	50-60	hcl	10YR46 56						0	0		0		M				
	60-120	c	10YR46 56						0	0		0		M				
4	0-25	zl	10YR42 00			C		Y	0	0		0						
	25-45	mzcl	10YR53 00	10YR58 00		C		Y	0	0		0						
	45-70	hzcl	10YR53 00	10YR58 00		C		Y	0	0		0				Y		
	70-100	fszl	10YR62 63	10YR58 00		C		Y	0	0		0						
5	0-30	mzcl	10YR41 42			C		Y	0	0		0						
	30-50	zc	05Y 71 00	10YR58 00		C		Y	0	0		0				Y		
6	0-35	zl	10YR32 00						0	0		0					Y	
	35-80	c	05Y 61 00	10YR58 00		M		Y	0	0		0				Y		
7	0-32	mzcl	10YR42 00			F			0	0		0					Y	
	32-45	mzcl	25Y 52 00	75YR46 00		C		Y	0	0		0						
	45-80	c	05Y 51 00	75YR58 00		M		Y	0	0		0				Y		
8	0-38	zl	10YR43 00						0	0		0						
	38-80	mzcl	75YR54 00						0	0		0		M				
9	0-37	zl	10YR43 00						0	0		0						
	37-60	zl	75YR44 00						0	0		0		M				
	60-80	mzcl	75YR54 00						0	0		0		M				
10	0-35	zl	10YR43 00						0	0		0						
	35-54	mzcl	75YR44 00						0	0		0		M				
	54-120	mzcl	75YR44 46						0	0		0		M				

				----MOTTLES-----			PED		----STONES----			STRUCT/	SUBS				
SAMPLE	DEPTH	TEXTURE	COLOUR	COL	ABUN	CONT	COL.	GLEY	>2	>6	LITH	TOT	CONSIST	STR	POR	IMP	SPL	CALC
11	0-35	fsz1	10YR43 00						0	0		0						
	35-45	fsz1	10YR33 00						0	0		0		M				
	45-56	fsz1	10YR43 00						0	0		0		M				
	56-65	mzc1	75YR54 00						0	0		0		M				
	65-120	hzc1	75YR54 00						0	0		0		M				
12	0-40	z1	10YR43 00						0	0		0						
	40-80	mc1	75YR54 00						0	0		0		M				
13	0-35	z1	10YR42 00						0	0		0						Y
	35-60	mzc1	10YR42 00	75YR46 00		C		Y	0	0		0						
	60-80	c	05Y 51 00	75YR58 00		M		Y	0	0		0					Y	