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ARUN DISTRICT LOCAL PLAN
SITE 6 : LAND WEST OF
NEW PLACE NURSERY
ARUNDEL ROAD, ANGMERING
AGRICULTURAL LAND CLASSIFICATION
ALC MAP & REPORT
MARCH 1994

ARUN DISTRICT LOCAL PLAN SITE 6
LAND WEST OF NEW PLACE NURSERY ARUNDEL ROAD, ANGMERING
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 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 Approximately 6 hectares of land relating to site 6, land to the north of Angmering in West Sussex was surveyed in March 1994. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 7 soil auger borings and one soil inspection pit were assessed 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 The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group of ADAS.

1.4 At the time of the survey the agricultural land was under a grass ley. A small area of urban land is identified which comprises gravel tracks.

1.5 The distribution of grades and subgrades is shown on the attached 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 survey information for this site.

Table 1 : Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site	% of Agricultural Land
3a	3.9	69.6	70.9
3b	1.6	28.6	29.1
Urban	0.1	1.8	100% (5.5 ha)
Total Area of Site	5.6	100%	

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 site is classified as subgrades 3a and 3b with soil wetness being the main limitation. The majority of land, classified as subgrade 3a comprises fine loamy soils which pass to slowly permeable clay in the lower subsoil. Soil drainage is impaired as a result of the clay and land is classified as subgrade 3a due to a moderate wetness limitation. Land classified as subgrade 3b consists of similar soils but with slowly permeable layers in the upper subsoil. Soils are poorly drained and land is classified as subgrade 3b due to a significant wetness limitation.

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 annual average rainfall, as a measure of overall wetness, and accumulated temperature, 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, it should be noted that climatic characteristics can interact with soil properties to influence soil wetness and droughtiness limitations.

Table 2 : Climatic Interpolation

Grid Reference :	TQ 065 053
Altitude (m) :	15
Accumulated Temperature (days) :	1528
Average Annual Rainfall (mm) :	772
Field Capacity (days) :	159
Moisture Deficit, Wheat (mm) :	118
Moisture Deficit, Potatoes (mm) :	114
Overall Climatic Grade :	1

3.0 Relief

3.1 The site lies at an altitude of approximately 10-20 metres AOD with land falling very gently west to the point of lowest altitude. Nowhere on the site do relief or gradient affect agricultural land quality.

4.0 Geology and Soil

4.1 The published geological sheet for the site, Sheet 317 (BGS, 1972) shows the underlying geology to the north to be Eocene Reading Beds (mottled clay) and London Clay to the south.

4.2 The published soils information for the area, Sheet TQ00 and TQ10 (SSGB, 1967) shows the majority of the site to comprise soils of the Park Gate Series (deep phase) which are described as "Deep stoneless silty soils variably affected by groundwater" (SSEW, 1983). To the north is mapped soils of the Titchfield and Wickham Series, described as "Poorly and imperfectly drained surface water gley soils developed in Eocene Clay" (SSEW, 1967). A detailed inspection of soils on the site revealed the presence of fine loamy soils over slowly permeable clay at various depths in the subsoil.

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.

Subgrade 3a

5.3 This good quality agricultural land typically comprises medium silty clay loam topsoils containing 0-2% total flints over upper subsoils of stoneless medium or heavy silty clay loam. This passes to poorly structured slowly permeable clay in the lower subsoil. Soil Pit 1 is typical of these soils which typically exhibit signs of wetness in the form of gleying above 40 cm depth caused by horizons of slowly permeable clay from 45-70 cm depth. Soils are assigned to wetness class III and this combined with a medium topsoil texture on this site results in a classification of subgrade 3a due to a moderate wetness limitation.

Subgrade 3b

5.4 This land comprises similar soils to subgrade 3a land with medium silty clay loam topsoils containing 5% total chalk stones and flints over thin upper subsoil horizons of heavy silty clay loam with 0-5% chalk stones. Lower subsoils comprise poorly structured slowly permeable clay. Similar signs of wetness problems in the form of gleying above 40 cm depth are present, but slowly permeable horizons of clay are present from 35-40 cm. The proximity of clay to the surface means that soils are more poorly drained than subgrade 3a land and a wetness class IV is assigned. Due to a significant wetness limitation flexibiltiy of cropping and stocking is impaired.

ADAS REFERENCE : 4202/067/94
MAFF REFERENCE : EL 42/460

Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOIL PIT DESCRIPTION

Site Name : ARUN LOCAL PLAN SITE 6 Pit Number : 1P

Grid Reference: TQ06500532 Average Annual Rainfall : 772 mm
Accumulated Temperature : 1528 degree days
Field Capacity Level : 159 days
Land Use : Ley
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 28	MZCL	10YR42 00	0	2		
28- 50	HZCL	10YR64 00	0	0	C	MDCSAB
50- 65	HCL	10YR64 00	0	0	M	MDCSAB
65-120	C	10YR63 00	0	0	M	WKCSAB

Wetness Grade : 3A Wetness Class : III
Gleying :028 cm
SPL :065 cm

Drought Grade : 2 APW : 143mm MBW : 25 mm
APP : 120mm MBP : 6 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Wetness

APPENDIX I

DESCRIPTION OF THE GRADES AND SUB-GRADES

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 on the 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.

Grade 3 : Good To Moderate Quality Agricultural Land

Land with moderate limitations which affect the choice of crops, 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.

Sub-grade 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.

Sub-grade 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 very 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 : 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/airfields. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

Woodland

Includes commercial and non-commercial 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

REFERENCES

* BRITISH GEOLOGICAL SURVEY (1972), Sheet No.317, Chichester, 1:63,360 scale.

* 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 No.6, "Soils Of South East England", 1:250,000 scale and accompanying legend.

* SOIL SURVEY OF GREAT BRITAIN (1967), Bulletin No.3, Soils of the West Sussex Coastal Plain.

APPENDIX III

DEFINITION OF SOIL WETNESS CLASSES

Wetness Class I

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

Wetness Class II

The soil profile is wet within 70cm depth for 31-90 days in most years **or**, if there is no slowly permeable layer within 80cm depth, it is wet within 70cm for more than 90 days, but not wet within 40cm depth for more than 30 days in most years.

Wetness Class III

The soil profile is wet within 70cm depth for 91-180 days in most years **or**, if there is no slowly permeable layer within 80cm depth, it is wet within 70cm for more than 180 days, but only wet within 40cm depth for 31-90 days in most years.

Wetness Class IV

The soil profile is wet within 70cm depth for more than 180 days but not wet within 40cm depth for more than 210 days in most years **or**, if there is no slowly permeable layer within 80cm depth, it is wet within 40cm depth for 91-210 days in most years.

Wetness Class V

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

Wetness Class VI

The soil profile is wet within 40cm depth for more than 335 days in most years.

(The number of days is not necessarily a continuous period. 'In most years' is defined as more than 10 out of 20 years.)

APPENDIX IV

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 **HRT** : Horticultural Crops **PGR** : Permanent Pasture **LEY** : Ley Grass **RGR** : Rough Grazing
SCR : Scrub **CFW** : Coniferous Woodland **DCW** : Deciduous Woodland **HTH** : Heathland **BOG** : Bog or Marsh
FLW : Fallow **PLO** : Ploughed **SAS** : Set aside **OTH** : Other

3. **GRDNT** : Gradient as measured by a hand-held optical clinometer.

4. **GLEY/SPL** : Depth in cm to gleying/slight 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 **CH** : Chemical **WE** : Wetness **WK** : Workability
DR : Drought **ER** : Soil Erosion Risk **WD** : Combined 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
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 MSST : soft, medium or coarse grained sandstone
SI : soft weathered igneous or metamorphic SLST : soft oolitic or dolimitic limestone
FSST : soft, fine grained sandstone ZR : soft, argillaceous, or silty rocks CH : chalk
GH : gravel with non-porous (hard) stones GS :gravel with porous (soft) 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

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	TQ06400540	LEY		020	035	4	3B		0		0					WE	3B	
1P	TQ06500532	LEY		028	065	3	3A	143	25	120	6	2				WE	3A	
2	TQ06500540	LEY				1	1	099	-19	106	-8	3A				DR	3A	IMP 60 Q3A
3	TQ06400530	LEY		025	040	4	3B		0		0					WE	3B	
4	TQ06500530	LEY		038	058	3	3A	140	22	117	3	2				WE	3A	
5	TQ06400520	LEY		025	045	3	3A		0		0					WE	3A	
6	TQ06500520	LEY		036	070	3	3A	146	28	125	11	2				WE	3A	BDRWC23
7	TQ06600535	LEY		028	055	3	3A	134	16	112	-2	2				WE	3A	

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL.	PED GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC
1	0-20	mzcl	10YR42 00						0	0	CH	5						
	20-35	hzcl	10YR52 00	10YR58 00	C			Y	0	0	CH	5		M				
	35-65	c	10YR62 00	10YR68 72	M			Y	0	0		0		P			Y	
1P	0-28	mzcl	10YR42 00						0	0	HR	2						
	28-50	hzcl	10YR64 00	10YR56 00	C			Y	0	0		0	MDCSAB FR	M				
	50-65	hcl	10YR64 00	10YR56 00	M		00MN00 00	Y	0	0		0	MDCSAB FR	M				
	65-120	c	10YR63 00	10YR68 71	M		00MN00 00	Y	0	0		0	WKCSAB FR	P	Y		Y	
2	0-25	mzcl	10YR43 00						0	0	CH	5						
	25-60	hzcl	10YR44 00						0	0		0		M				IMP 60
3	0-25	mzcl	10YR43 00						0	0	HR	5						
	25-40	hzcl	10YR52 44	10YR58 00	C			Y	0	0		0		M				
	40-70	c	10YR62 00	10YR68 72	M		00MN00 00	Y	0	0		0		P			Y	
4	0-28	mzcl	10YR42 00						0	0	HR	2						
	28-38	mzcl	10YR53 00	10YR56 00	F				0	0		0		M				
	38-58	hcl	10YR53 00	75YR56 00	C		00MN00 00	Y	0	0		0		M				
	58-120	c	10YR64 00	75YR56 00	M		00MN00 00	Y	0	0		0		P			Y	
5	0-25	mzcl	10YR43 41						0	0		0						
	25-45	hzcl	10YR53 00	10YR58 61	C			Y	0	0		0		M				
	45-70	c	10YR62 00	10YR68 72	M		00MN00 00	Y	0	0		0		P			Y	
6	0-36	mzcl	10YR42 00						0	0	HR	2						
	36-70	hzcl	25Y 64 63	75YR56 00	C			Y	0	0		0		M				
	70-120	c	25Y 64 63	75YR56 00	M		00MN00 00	Y	0	0		0		P			Y	
7	0-28	mcl	10YR53 00						0	0	HR	1						
	28-55	hcl	25Y 64 00	75YR56 00	C			Y	0	0		0		M				
	55-120	c	25Y 64 00	75YR56 00	M		00MN00 00	Y	0	0	HR	5		P			Y	