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Land west of Foreman Road, Ash, Surrey
Agricultural Land Classification
ALC Map and Report
June 1995

AGRICULTURAL LAND CLASSIFICATION REPORT

LAND WEST OF FOREMAN ROAD, ASH, SURREY

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 around Ash in the Guildford Borough of Surrey The work forms part of MAFF s statutory input to a number of ad-hoc applications for residential development submitted to the planning authority

1 2 At this location the area of the application site totals 0 8 hectares although the total area of the survey site totals 3 4 hectares An additional area has been surveyed to the south of the application site so that a more comprehensive map of the land quality in the vicinity may be obtained An Agricultural Land Classification (ALC) survey was carried out in June 1995 The survey was undertaken at a detailed level of approximately two borings per hectare A total of 6 borings and one soil inspection pit were assessed according to 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 carried out 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 on the site comprised rough grassland and permanent grassland being grazed by horses The area marked as urban includes a private dwelling non-agricultural land comprises scrubland

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 10 000 It is accurate at this scale but any enlargement would be misleading This map supersedes any previous ALC survey information for the site

Table 1 Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site
3b	2 6	76 5
Non-agricultural	0 5	14 7
Urban	0 3	8 8
Total area of Site	3 4	100 0

1 6 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 7 All of the agricultural land surveyed on the site has been classified as Subgrade 3b moderate quality land with soil wetness and droughtiness as the main limitations Soils towards the south of the site typically comprise medium clay loam topsoils over clay subsoils The clay subsoils are slowly permeable and cause a significant drainage impedance This wetness limitation will affect crop rooting and growth and will increase the likelihood of structural damage through trafficking by agricultural machinery or poaching by grazing livestock Soils become more sandy towards the north of the site typically loamy sands over sand subsoils such that they show a significant restriction upon profile available water for plant growth The affect that this will have upon the level and consistency of crop yields means that a classification of Subgrade 3b is appropriate

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 (day degrees Celsius 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 However climatic factors do interact with soil properties to influence soil wetness and droughtiness limitations

2 4 No local climatic factors such as exposure or frost risk are believed to affect the site

Table 2 Climatic Interpolation

Grid Reference	SU 899 504
Altitude (m AOD)	80
Accumulated Temperature (day degrees Jan-June)	1438
Average Annual Rainfall (mm)	697
Field Capacity (days)	148
Moisture Deficit Wheat (mm)	109
Moisture Deficit Potatoes (mm)	101
Overall Climatic Grade	1

3 Relief

3 1 The land on this site falls gently to the south west lying at approximately 80m AOD Nowhere on the site does altitude or relief impose limitations to agricultural land quality

4 Geology and Soil

4 1 The relevant geological sheet (BGS 1976) shows the majority of the site mapped as London Clay with Bagshot Beds in the north

4 2 The published soil information (SSEW 1983) shows the Wickham 3 soil association across most of the site These soils are described as Slowly permeable seasonally waterlogged fine loamy over clayey and coarse loamy over clayey soils and similar more permeable soils with slight waterlogging Some deep coarse loamy soils affected by groundwater (SSEW 1983) In the north the Swanwick soil association has been mapped These are said to be 'Deep permeable coarse loamy and sandy soils some peaty surface horizons affected by groundwater (SSEW 1983)

4 3 Detailed field survey broadly confirms the existence of soils similar to those described in paragraph 4 2

5 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 3b

5 3 All of the agricultural land on this site has been classified as Subgrade 3b moderate quality land, with soil droughtiness and wetness as the main limitations

5 4 To the north of Foreman Manor soil profiles typically comprise very slightly flinty (2-10% total flint) loamy medium sandy loam topsoils and upper subsoils At approximately 40cm depth medium sand subsoils were observed Given the local climatic regime a combination of coarse textured soils and profile stone contents means that there is a restriction upon the amount of profile available water such that is not fully adequate for crop growth This can affect the level and consistency of crop yields such that a classification of Subgrade 3b due to this significant droughtiness limitation is appropriate

5 5 In the south of the site soil profiles were found to contain little or no flint (0-2% total) comprising medium clay loam topsoils over clay upper subsoils Pit 1 which is typical of these profiles shows the clay to be poorly structured and

slowly permeable from below the topsoils (26-30cm depth) Profiles tend to show evidence of a wetness imperfection in the form of gleying from below the topsoil Such drainage characteristics equate these soils to Wetness Class IV with a resultant classification of Subgrade 3b at this location Occasional soil observations found a medium sandy loam upper subsoil over slowly permeable clay at 60cm depth At these locations water seepage at the junction of two different geological types has resulted in wet flushes as evidenced by the presence of hydrophilic plant species such as Juncus rushes Poorly drained wet soils may inhibit plant growth and rooting and may be more susceptible to structural damage through trafficking by agricultural machinery or poaching by grazing livestock

ADAS Ref 4003/121/95
MAFF Ref 40/1211

Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1976) Sheet No 285 Aldershot 1 50 000 Scale (solid & drift edition)

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 6 Soils of South East England 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 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

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)

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 friable **FR** friable **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 appropiate 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 W OF FOREMAN RD ASH Pit Number 1P

Grid Reference SU89885043 Average Annual Rainfall 697 mm
Accumulated Temperature 1438 degree days
Field Capacity Level 148 days
Land Use Permanent Grass
Slope and Aspect degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 26	MCL	10YR62 00	0	2	HR	C				
26- 46	C	10YR52 00	0	0		M	WKCAB	FM	P	
46- 70	C	05Y 61 00	0	0		M	MDCAB	FM	P	

Wetness Grade 3B Wetness Class IV
Gleying 0 cm
SPL 026 cm

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

FINAL ALC GRADE 3B
MAIN LIMITATION Wetness

AMPLE 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	SU89905060	RGR					1	1	074	-37	059	46	3B				DR	3B	
1P	SU89885043	PGR		0	026		4	3B	000	0	000	0					WE	3B	
2	SU89805050	PGR		0	060		4	3B	000	0	000	0					WE	3B	SEEPAGE
3	SU89865050	PGR		0	060		3	3B	000	0	000	0					WE	3B	SEEPAGE
4	SU89895042	PGR		0	030		4	3B	000	0	000	0					WE	3B	PLSTC45
5	SU89975066	RGR					1	1	038	-73	038	-67	4				DR	3B	IMPEN 30
6	SU89885056	PGR		0			2	1	081	-30	063	42	3B				DR	3B	GROUNDWATER

AMPLE	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	lms	10YR32 00						0	0	HR	5							
	30-40	lms	10YR32 00						0	0	HR	10		M					
	40 60	ms	10YR63 64						0	0	HR	15		M					
	60-120	ms	10YR64 00						0	0	HR	10		M					
1P	0-26	mcl	10YR62 00	10YR58 00	C			Y	0	0	HR	2							
	26-46	c	10YR52 00	10YR58 61	M			Y	0	0		0	WKCAB	FM	P	Y		Y	
	46-70	c	05Y 61 00	75YR58 00	M			Y	0	0		0	MDCAB	FM	P	Y		Y	
2	0 30	mcl	10YR31 00	75YR56 00	M			Y	0	0		0							
	30-60	msl	05Y 51 00	75YR46 00	M			Y	0	0		0		M					WATER SEEPAGE
	60-90	c	10YR52 00	10YR58 00	M			Y	0	0		0		P			Y		QUERY WET CLASS
3	0-25	mcl	10YR31 00	75YR46 00	M			Y	0	0	HR	2							
	25-60	msl	05Y 51 00	75YR46 00	M			Y	0	0	HR	2		M					WATER SEEPAGE
	60-80	c	10YR52 61	10YR68 56	M			Y	0	0	HR	2		P			Y		QUERY WET CLASS
4	0-30	mcl	10YR32 00	10YR58 00	C			Y	0	0	HR	2							
	30-45	c	10YR52 00	10YR58 00	M			Y	0	0	HR	2		P			Y		
	45-65	c	05Y 61 00	75YR58 00	M			Y	0	0		0		P			Y		
5	0-30	lms	10YR32 00						0	0	HR	3							
6	0-30	lms	10YR42 00	10YR56 00	C			Y	0	0	HR	2							
	30-45	lms	10YR32 00	10YR58 00	C			Y	0	0		0		M					
	45-80	ms	10YR31 51					Y	0	0		0		M					
	80-100	lms	10YR51 00					Y	0	0		0		M					
	100 120	ms	10YR64 00					Y	0	0		0		M					