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Wokingham District Local Plan
Site SW07 - Land at Part Lane, Riseley, Berkshire.
Agricultural Land Classification
ALC Map and Report
February 1996

Resource Planning Team
Guildford Statutory Group
ADAS Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

WOKINGHAM DISTRICT LOCAL PLAN
SITE SW07 - LAND AT PART LANE, RISELEY, BERKSHIRE

Introduction

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 3.7 hectares of land between Part Lane and The Devils Highway in Riseley, Berkshire. The survey was carried out during February 1996.

2. The survey was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF) from its Land Use Planning Unit in Reading in connection with the Wokingham District Local Plan. The results of this survey supersede any previous ALC information for this land.

3. The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group of ADAS. The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF, 1988). A description of the ALC grades and subgrades is given in Appendix I.

4. At the time of survey all of the site was agricultural land under permanent grass.

Summary

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10,000. It is accurate at this scale, but any enlargement would be misleading.

6. The fieldwork was conducted at an average density of approximately 1 boring per hectare. A total of 5 borings and two soil pits were described.

7. The land at this site has been classified as Subgrade 3a (good quality) on the basis of both soil wetness and soil droughtiness limitations.

8. Over the majority of the site, soil droughtiness is the principal limitation. Moderately to very stony light loamy and sandy soils overlie gravelly and/or clayey horizons at moderate depths in the profile. The stones in the profile cause a reduction in available water, such that there is a risk of droughtiness affecting plant growth and yield.

9. Towards the centre of the site, soil wetness is the principal limitation. In this area medium silty topsoils and gleyed medium silty upper subsoils overlie poorly structured, gleyed and slowly permeable clays at moderate depths in the profile. The slowly permeable horizons cause drainage to be impeded such that land utilisation is restricted.

Climate

12. Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.

13. The key climatic variables used for grading this site are given in Table 1 and were obtained from the published 5km grid datasets using standard interpolation procedures (Met. Office, 1989).

Table 1: Climatic and altitude data

Factor	Units	Values
Grid reference	N/A	SU 725 631
Altitude	m, AOD	55
Accumulated Temperature	day°C	1462
Average Annual Rainfall	mm	678
Field Capacity Days	days	141
Moisture Deficit, Wheat	mm	110
Moisture Deficit, Potatoes	mm	104

14. 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.

15. The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR), as a measure of overall wetness, and accumulated temperature (ATO, January to June), as a measure of the relative warmth of a locality.

16. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation. Other local climatic factors such as exposure and frost risk are also believed not to affect the site. The site is climatically Grade 1.

Site

17. The site lies at an altitude between approximately 55 and 60m AOD. The site slopes slightly from west to east. Nowhere on the site does gradient or microrelief affect land quality.

Geology and soils

18. The published geological information for the site (BGS, 1971), shows the site to be underlain London Clay in the south west and west. Over the remainder of the area, valley gravels are shown overlying the London Clay.

19. The most recent published soils information for the site (SSEW, 1983 and 1984) shows the site to comprise soils of the Hurst association. These are described as, 'coarse and fine loamy permeable soils mainly over gravel variably affected by groundwater.' (SSEW, 1983). Soils of this broad type were found across the majority of the site. Towards the centre and south east of the site slowly permeable subsoils were encountered.

Agricultural Land Classification

20. The details of the classification of the site are shown on the attached ALC map.

21. The location of the auger borings and pits is shown on the attached sample location map and details of the soils data are presented in Appendix III.

Subgrade 3a

22. Land of good quality has been mapped over the whole site. Principal limitations to land quality include soil droughtiness and soil wetness.

23. The majority of the site is affected by soil droughtiness. Soils here commonly comprise a slightly to moderately stony (up to 15% v/v total flints, including up to 3%>2cm) medium sandy loam topsoil. This passes to a moderately or very stony (15-40% total v/v flints), gleyed, medium sandy loam or loamy medium sand upper subsoil horizon. The lower subsoil horizons were more variable, being in two main groups covering approximately equal areas over the site. The first occurs towards the east and south west of the site. These soils comprise moderately to very stony (15-52% v/v total flints), gleyed sandy clay loam horizons which were commonly impenetrable to the soil auger. The pit observation, 1P confirms that the soil resource extends to depth (120cm) and comprises further sandy clay loam horizons with variable stone contents. From approximately 80cm the soil profile was saturated at the time of survey. The stones in the profile cause the water holding capacity of the soil profile to be reduced to the extent that, in the local climate Subgrade 3a is appropriate. Soil droughtiness restricts crop establishment, growth and yield.

24. The second lower subsoil type occurs towards the west and south east of the site and is represented by the pit observation, 2P. In these parts of the site, the lower subsoils comprise a gravelly (approximately 55-60% v/v small flints), loamy medium sand or medium sand horizon which passes to a generally impenetrable (to the soil auger and spade) similarly textured but more stony horizon at approximately 60cm. In the local climate a profile of this nature results in a Grade 4 classification due to soil droughtiness as a result of the stones in the profile, the generally sandy nature and the restricted depth of the soil resource. However, on occasion the stony sandy horizons were penetrated. They gave way to a gleyed and slowly permeable clay at approximately 75cm thus showing that a rootable soil resource may extend beyond the impenetrable horizon and that this would be possible throughout the site. As this is assumed to be the case, these profiles would normally be mapped as a separate Subgrade 3b mapping unit but, due to the small size and flat nature of the site this was not considered viable. Therefore these small areas have been included in Subgrade 3a.

25. The area affected by soil wetness is towards the centre of the site. Soils here commonly comprise a very slightly stony (up to 3% v/v total flints), medium silty clay loam topsoil. This passes to a stoneless, gleyed medium silty clay loam upper subsoil horizon

overlying a gleyed, stoneless heavy silty clay loam horizon. This passes to a thin, wet, slightly stony (15% v/v total flints), gleyed medium silty clay loam horizon which overlies stoneless gleyed and slowly permeable silty clay lower subsoils. The slowly permeable clay horizon restricts water flow through the soil profile so causing drainage to be impeded to the extent that Wetness Class III has been appropriately applied to this land given the local climate. Given the workability status of the topsoil in this area and the depth to the slowly permeable horizon, these observations are of Subgrade 3a quality. Soil wetness affects plant growth and yield as well as restricting land utilisation in terms of the number of days when machinery cultivations and grazing by livestock can occur without causing structural damage to the soil.

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SOURCES OF REFERENCE

British Geological Survey (1971) *Sheet 268, Reading. Drift Edition. 1:63 360. Scale.* BGS: London.

Ministry of Agriculture, Fisheries and Food (1988) *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land.* MAFF: London.

Met. Office (1989) *Climatological Data for Agricultural Land Classification.* Met. Office: Bracknell.

Soil Survey of England and Wales (1983) *Soils of South East England. 1:250 000 Scale.* SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils of South East England. Bulletin No. 15.* SSEW: Harpenden.

APPENDIX I

DESCRIPTIONS 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.

APPENDIX II

SOIL WETNESS CLASSIFICATION

Definitions of Soil Wetness Classes

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.

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.

Assessment of Wetness Class

Soils have been allocated to wetness classes by the interpretation of soil profile characteristics and climatic factors using the methodology described in *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land* (MAFF, 1988).

[1] The number of days is not necessarily a continuous period.

[2] 'In most years' is defined as more than 10 out of 20 years.

APPENDIX III

SOIL DATA

Contents:

Sample location map

Soil abbreviations - Explanatory Note

Soil Pit Descriptions

Soil boring descriptions (boring and horizon levels)

Database Printout - Horizon Level Information

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 dolomitic 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 sandston	**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 **ST**: strongly developed	**MD**: moderately developed
ped size	**F**: fine **C**: coarse	**M**: medium **VC**: very coarse
ped shape	**S** : single grain **GR**: granular **SAB**: sub-angular blocky **PL**: platy	**M**: massive **AB**: angular blocky **PR**: prismatic

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 appropriate 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 : WOKINGHAM DLP SW07 Pit Number : 1P

Grid Reference: SU72506320
Average Annual Rainfall : 678 mm
Accumulated Temperature : 1462 degree days
Field Capacity Level : 141 days
Land Use : Permanent Grass
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 27	MSL	10YR41 42	3	13	HR					
27- 58	MSL	10YR53 00	0	17	HR	C	MDCSAB	VF	M	
58- 71	MSL	10YR61 00	0	40	HR	M	WKCAB	VF	M	
71- 83	SCL	25Y 62 00	0	52	HR	M		FR	M	
83-100	SCL	25Y 62 00	0	15	HR	M	MDCSAB	FM	M	
100-120	SCL		0	50	HR				P	

Wetness Grade : 1
Wetness Class : II
Gleying : 27 cm
SPL : cm

Drought Grade : 3A
APW : 115mm MBW : 5 mm
APP : 91 mm MBP : -13 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Droughtiness

SOIL PIT DESCRIPTION

Site Name : WOKINGHAM DLP SW07 Pit Number : 2P

Grid Reference: SU72406310
Average Annual Rainfall : 678 mm
Accumulated Temperature : 1462 degree days
Field Capacity Level : 141 days
Land Use : Permanent Grass
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 22	MSL	10YR41 00	3	13	HR					
22- 45	LMS	25Y 71 00	0	41	HR	C	WKCAB	VF	M	
45- 60	MS	25Y 52 00	0	49	HR	M		VF	M	

Wetness Grade : 1
Wetness Class : II
Gleying : 22 cm
SPL : cm

Drought Grade : 4
APW : 47 mm MBW : -63 mm
APP : 48 mm MBP : -56 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Droughtiness

program: ALC012 LIST OF BORINGS HEADERS 30/05/96 WOKINGHAM DLP SW07 page 1

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	SU72506320	PGR			30		2	1	87	-23	92	-12	3B				DR	3A	IMP FLINTS 72
1P	SU72506320	PGR			27		2	1	115	5	91	-13	3A				DR	3A	IMP PIT 100
2	SU72406310	PGR			28		2	1	51	-59	51	-53	4				DR	3B	IMP FLINTS 50
2P	SU72406310	PGR			22		2	1	47	-63	48	-56	4				DR	3B	IMP PIT 60
3	SU72506310	PGR			33	60	3	3A	141	31	118	14	1				WE	3A	
4	SU72406300	PGR	SW	01	28		2	1	83	-27	88	-16	3B				DR	3A	IMP FLINTS 75
5	SU72576306	PGR			30	75	2	1	100	-10	73	-31	3B				DR	3B	

program: ALC011 COMPLETE LIST OF PROFILES 30/05/96 WOKINGHAM DLP SW07 page 1

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	STR	SUBS POR	IMP	SPL	CALC	
1	0-30	msl	10YR42 00						3	0	HR	10							SEE 1P
	30-50	msl	10YR53 52	10YR58 00	M			Y	0	0	HR	15		M					
	50-65	msl	10YR53 63	10YR58 00	M			Y	0	0	HR	35		M					
	65-72	scl	25Y 61 00	75YR58 00	M			Y	0	0	HR	40		M					IMP FLINTS 72
1P	0-27	msl	10YR41 42						3	0	HR	13							SIEVED
	27-58	msl	10YR53 00	10YR58 00	C		00MN00 00	Y	0	0	HR	17	MDCSAB	VF	M				SIEVED
	58-71	msl	10YR61 00	10YR58 00	M		00MN00 00	Y	0	0	HR	40	WKCAB	VF	M				SIEVED
	71-83	scl	25Y 62 00	10YR58 00	M			Y	0	0	HR	52		FR	M				SIEVED
	83-100	scl	25Y 62 00	10YR58 00	M			Y	0	0	HR	15	MDCSAB	FM	M				
	100-120	scl						Y	0	0	HR	50			P				IMP PIT 100
2	0-28	msl	10YR42 00						3	0	HR	15							SEE 2P
	28-50	lms	10YR63 64	10YR58 00	C			Y	0	0	HR	40			M				IMP FLINTS 50
2P	0-22	msl	10YR41 00						3	0	HR	13							SIEVED
	22-45	lms	25Y 71 00	10YR58 00	C			Y	0	0	HR	41	WKCAB	VF	M				SIEVED
	45-60	ms	25Y 52 00	10YR58 00	M			Y	0	0	HR	49		VF	M				SIEVED PIT IMP 60
3	0-33	mzcl	10YR42 00						0	0	HR	3							
	33-45	mzcl	10YR51 00	10YR56 00	C			Y	0	0		0			M				
	45-55	hzcl	25Y 61 00	10YR58 00	M			Y	0	0		0			M				
	55-60	mzcl	10YR61 00	10YR58 00	M			Y	0	0	HR	15			M				VERY WET
	60-120	zc	25Y 62 00	10YR58 00	M			Y	0	0		0			P		Y		DRIER
4	0-28	msl	10YR42 00						3	0	HR	15							
	28-50	msl	25Y 52 00	10YR58 00	M			Y	0	0	HR	35			M				
	50-75	scl	25Y 52 00	10YR58 00	M			Y	0	0	HR	20			M				IMP FLINTS 75
5	0-30	msl	10YR41 00	10YR46 00	F				3	0	HR	15							
	30-50	msl	10YR53 00	10YR56 00	C			Y	0	0	HR	30			M				
	50-75	lms	05Y 71 00	75YR58 00	M			Y	0	0	HR	50			M				VERY WET
	75-120	c	25Y 61 00	75YR58 00	M			Y	0	0	HR	10			P		Y		SLIGHTLY DRIER