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Aylesbury Vale Local Plan
Land at Buckingham Road,
Winslow, Buckinghamshire
Agricultural Land Classification Report
June 1996.**

**Resource Planning Team
Guildford Statutory Group
ADAS Reading**

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AGRICULTURAL LAND CLASSIFICATION REPORT

AYLESBURY VALE LOCAL PLAN LAND AT BUCKINGHAM ROAD, WINSLOW

Introduction

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey on approximately 5 hectares of land between Buckingham Road and Furze Lane, to the north of the railway line, in Winslow, Buckinghamshire. The survey was carried out during June 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 Aylesbury Vale 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 agricultural land on this site was under permanent grassland. The areas shown as 'Other Land' include derelict farm and army buildings as well as a cemetery.

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 area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1 below.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% Total site area	% Surveyed Area
2	4.3	81.1	100.0
Other land	1.0	18.9	-
Total surveyed area	4.3	-	100.0
Total site area	5.3	100.0	-

7. The fieldwork was conducted at an average density of 1 boring per hectare. A total of 4 borings and one soil inspection pit were described.

8. All of the agricultural land on this site has been classified as Grade 2 land (very good quality) on the basis of a minor soil droughtiness limitation.

9. In general the profiles are well drained comprising very slightly flinty medium clay loam topsoils over similar or marginally sandier upper subsoils with a slight flint content. The lower subsoils are only very slightly stony but distinctly sandier, comprising well structured loamy medium sands or medium sands. In this local climatic regime the combination of soil textures, structures and stone contents acts to slightly reduce the amount of profile available water for crops. As a result the level and consistency of crop yields is restricted.

FACTORS INFLUENCING ALC GRADE

Climate

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

11. The key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5km grid datasets using the standard interpolation procedures (Met. Office, 1989).

12. 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.

Table 2: Climatic and altitude data

Factor	Units	Values
Grid reference	N/A	SP 765 283
Altitude	m, AOD	110
Accumulated Temperature	day°C (Jan-June)	1372
Average Annual Rainfall	mm	677
Field Capacity Days	days	142
Moisture Deficit, Wheat	mm	103
Moisture Deficit, Potatoes	mm	93

13. 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 (AT0, January to June), as a measure of the relative warmth of a locality.

14. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation (Climatic Grade 1). However, climatic factors can interact with soil properties to influence soil wetness and droughtiness.

15. Local climatic factors such as frost risk and exposure are not thought likely to adversely affect agricultural land use on this site.

Site

16. The land on this site is relatively flat ranging from 109m AOD in the north to 113m AOD in the south east.

17. Local site factors such as flooding, microrelief and gradient are not likely to affect land quality in this area.

Geology and soils

18. The relevant geological sheet (BGS, 1896) maps chalky Boulder Clay and Glacial sands across the site.

19. The most recently published soils information for this area (SSEW, 1983) maps the Ashley soil association across the site. These soils are described as 'Fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging. Associated with similar but wetter soils. Some calcareous and non-calcareous slowly permeable clayey soils.' (SSEW, 1983).

20. Detailed field examination revealed soils of a similar nature to those described above across the site. However, these were generally more sandy.

Agricultural Land Classification

21. The details of the classification of the site are shown on the attached ALC map and the area statistics of each grade are given in Table 1, page 1.

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

Grade 2

23. All of the agricultural land on this site has been mapped as Grade 2 (very good quality). The profiles are typically well drained and non-calcareous, comprising very slightly stony (2-5% total flints) medium clay loam topsoils over moderately structured, slightly stonier (5-10% total flints), heavy clay loam or sandy clay loam upper subsoils. At between 30cm and 48cm depth the profiles generally become impenetrable to the soil auger due to the extremely dry conditions at the time of survey and a slight stone content. Soil inspection Pit 1 is, however, believed to be representative of the site and shows that the soil resource continues to depth. Here, a moderately well structured sandy clay loam subsoil with 10% total flint overlies loamy medium sands and medium sands at 70cm depth. These horizons, which are well structured and very slightly stony (1-5 % total flint), continue to at least 120cm depth. In this locally cool and dry climatic regime the combined effects of soil texture, structure and stone content lead to a slight soil droughtiness limitation as the amount of profile available water for crops is slightly reduced. Some variation in soil composition was recognised on the site. Occasional profiles comprised poorly structured heavy clay loam and clay upper subsoils before the profile became impenetrable at 48cm depth over chalky gravel. It is not thought likely that the poorly structured horizon continues beyond this point due to

due to the presence of the gravel. However the dry conditions prevented confirmation of this. As these borings were surrounded by Grade 2 land, and were too limited in number and extent to map separately, they have been included in the Grade 2 mapping unit.

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SOURCES OF REFERENCE

British Geological Survey (1896) *Sheet No. XIX, Bucks.* 1:10560 Series. Drift.
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) *Sheet 6, Soils of South East England.*
SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in South East England*
SSEW: Harpenden

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. **GLEYS/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. **GLEYS:** 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 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 : AYLESBURYLP,BUCKS ROAD Pit Number : 1P

Grid Reference: SP76402830 Average Annual Rainfall : 677 mm
 Accumulated Temperature : 1372 degree days
 Field Capacity Level : 142 days
 Land Use : Permanent Grass
 Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 27	MCL	10YR42 00	0	2	HR					
27- 40	SCL	10YR43 00	0	8	HR		MDCSAB	FM	M	
40- 70	SCL	10YR44 43	0	10	HR	C	MDCSAB	FM	M	
70- 90	LMS	10YR42 00	0	5	HR	C	MDCSAB	FR	G	
90-120	MS	75YR56 46	0	1	HR		WKCSAB	FR	G	

Wetness Grade : 1 Wetness Class : I
 Gleying : 040 cm
 SPL : No SPL

Drought Grade : 2 APW : 123mm MBW : 20 mm
 APP : 107mm MBP : 14 mm

FINAL ALC GRADE : 2
 MAIN LIMITATION : Droughtiness

SAMPLE NO.	GRID REF	ASPECT USE	--WETNESS--		-WHEAT-		-POTS-		M.REL		EROSN	FROST	CHEM	ALC	COMMENTS	
			GRDNT	GLEYSPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST		LIMIT
1	SP76402850	PGR	025		2	2	72	-31	72	-21	3B			DR	2	I45 See 1p
1P	SP76402830	PGR	040		1	1	123	20	107	14	2			DR	2	At Boring 4
2	SP76402840	PGR			1	1	50	-53	50	-43	4			DR	2	I30 See 1P
3	SP76502840	PGR	025		2	1	73	-30	73	-20	3B			DR	2	I48 See 1P
4	SP76402830	PGR			1	1	50	-53	50	-43	4			DR	2	I30 See 1P

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED COL.	----STONES----			STRUCT/ CONSIST	SUBS			CALC	
				COL	ABUN	CONT		GLE	>2	>6		LITH	TOT	STR		POR
1	0-25	mc1	10YR44 00						0	0	HR	5				
	25-45	hc1	10YR53 00	75YR58 00	C			Y	0	0	HR	10	M			Imp flinty
1P	0-27	mc1	10YR42 00						0	0	HR	2				
	27-40	sc1	10YR43 00						0	0	HR	8	MDCSAB	FM	M	
	40-70	sc1	10YR44 43	75YR58 00	C			S	0	0	HR	10	MDCSAB	FM	M	
	70-90	lms	10YR42 00	75YR58 00	C			Y	0	0	HR	5	MDCSAB	FR	G	
	90-120	ms	75YR56 46						0	0	HR	1	WKCSAB	FR	G	
2	0-25	mc1	10YR43 00						0	0	HR	5				
	25-30	sc1	10YR43 00						0	0	HR	10	M			
3	0-25	mc1	10YR42 00						0	0	HR	5				Y
	25-40	c	25Y 52 53	75YR58 00	C		00MN00	00	Y	0	0	HR	5	P		Y
	40-48	hc1	25Y 52 53	10YR58 00	C		00MN00	00	Y	0	0	HR	10	M		Y I Calc/Gravel
4	0-25	mc1	10YR43 00						0	0	HR	5				
	25-30	sc1	10YR43 00						0	0	HR	10	M			Imp dry/flinty