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**WYCOMBE DISTRICT LOCAL PLAN
Hazlemere Park and Ride
High Wycombe, Buckinghamshire**

**Agricultural Land Classification
ALC Map and Report**

April 1999

**Resource Planning Team
Eastern Region
FRCA Reading**

**RPT Job Number: 0305/028/99
MAFF Reference: EL 03/01404**

AGRICULTURAL LAND CLASSIFICATION REPORT

WYCOMBE DISTRICT LOCAL PLAN HAZLEMERE PARK AND RIDE HIGH WYCOMBE, BUCKINGHAMSHIRE

INTRODUCTION

1. This summary report presents the findings of a detailed Agricultural Land Classification (ALC) survey of approximately 5 ha of land at Hazlemere, High Wycombe, Bucks. The survey was carried out during April 1999.
2. The survey was undertaken by the Farming and Rural Conservation Agency (FRCA)¹ on behalf of the Ministry of Agriculture, Fisheries and Food (MAFF). The survey was carried out in connection with MAFF's statutory input to The Wycombe District Local Plan and this survey supersedes any previous ALC information for this land.
3. The work was conducted by members of the Resource Planning Team in the Eastern Region of FRCA. 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 the land use on the site was rough grassland.

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.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
3a	3.3	68.8	68.8
3b	1.5	31.2	31.2
Total surveyed area	4.8	100	100
Total site area	4.8	-	100

7. The fieldwork was conducted at an average density of 1 boring per hectare of agricultural land. A total of 7 borings and 1 soil pits was described.
8. The majority of the site is classified as Subgrade 3a (good quality agricultural land) with a smaller area classified as Subgrade 3b (moderate quality agricultural land) in the south-west of

¹ FRCA is an executive agency of MAFF and the Welsh Office

the site adjacent to Queensway. The land is mainly restricted by soil wetness (of varying severity) with soil droughtiness being equally restricting in some places

9. The area of the site classified as Subgrade 3a agricultural land is affected primarily by soil wetness. The soils are variable but typically comprise fine silty and loamy topsoils, passing to fine loamy and clayey subsoils which will restrict the drainage of water through the profile during wetter periods. Soil wetness will affect crop growth and impose some limitations on mechanised operations or stocking due to the risk of compaction by machinery or poaching by livestock. Some areas are also affected by soil droughtiness in conjunction with soil wetness. The presence of stones within some soils on the site restricts the amount of available water. Soil droughtiness affects the versatility of the land by reducing the amount and consistency of yields, particularly in the drier years.
10. The area of the site classified as Subgrade 3b is subject to more severe wetness than the rest of the site. The soils also comprise fine silty topsoils but these pass immediately to clay subsoils which restrict drainage to a greater extent than the area classified as Subgrade 3a. The effect of this will be to further reduce the versatility of the land in that there will be less opportunities for mechanised fieldwork or for carrying livestock since either activity is likely to cause structural damage to the land during wet periods.

FACTORS INFLUENCING ALC GRADE

Climate

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

Table 2: Climatic and altitude data

Factor	Units	Values	
		SU 896 957	SU 897 956
Grid reference	N/A	SU 896 957	SU 897 956
Altitude	m, AOD	165	170
Accumulated Temperature	day°C (Jan-June)	1321	1315
Average Annual Rainfall	mm	760	761
Field Capacity Days	days	163	163
Moisture Deficit, Wheat	mm	91	90
Moisture Deficit, Potatoes	mm	78	77
Overall climatic grade	N/A	Grade 2	Grade 2

11. 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.

12. 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.
13. The combination of rainfall and temperature at this site mean that climate is limiting. Given the location, altitude and aspect of the land, the site is considered to be at risk from exposure. The degree of risk has been assessed as 'slight'. The site is climatically Grade 2.

Site

14. The majority of the site is virtually flat. Land on the north and east of the site is gently sloping. Nowhere do gradient, microrelief or flooding affect the site.

Geology and soils

15. The most detailed published geological information (BGS, 1948) shows the site to be underlain by Clay-with-flints over Upper Chalk (soft white chalk with many flints).
16. According to the most recent published soils information for site (SSEW, 1983), the land is underlain by one soil association, Batcombe. This soil association is describes as 'Fine silty over clayey and fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging. Some well drained clayey soils over chalk. Variably flinty (SSEW, 1983). Soils which fitted this description were encountered on the site.

AGRICULTURAL LAND CLASSIFICATION

17. 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.
18. 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 II.

Subgrade 3a

19. The majority of the site is mapped as good quality land. Soil wetness is the principal limitation in this unit although soil droughtiness is equally limiting in a few places. Soil profiles comprise medium silty clay loam topsoils merging to similarly textured upper subsoils which, in turn, pass to heavier lower subsoils and, ultimately, clay. The presence of gleying within 40 cm and of a slowly permeable layer starting from about 55cm results in these soils being placed in Wetness Class III which, in combination with the medium silty clay loam topsoils, indicates that a Classification of Subgrade 3a is appropriate. The upper and lower subsoils contain up to a maximum of 30% stone content by volume which, at some borings, were impenetrable to the auger. However, the presence of stones within these profiles (typified by pit observation 1P) was not more limiting than the effects of soil wetness and therefore in this instance a classification of Subgrade 3a on the basis of soil wetness as the overriding limitation is appropriate. Soil wetness affects crop growth and imposes some limitations on mechanised operations or stocking due to the risk of compaction by machinery or poaching by livestock.

Subgrade 3b

20. The south-west of the site is of moderate quality. Soils in this area comprise medium silty clay loam topsoils passing directly to clay subsoils which restrict drainage to a greater extent than the area classified as Subgrade 3a. Gleying was observed within 40 cm of the soil surface and the clay subsoils were identified as being slowly permeable and these are typified in pit observation 1P. As result, these soils are placed in Wetness Class IV. The combination of these soil properties within the prevailing field capacity level (163 days) leads to a classification of Subgrade 3b on the basis of soil wetness which is more severe than the adjacent Subgrade 3a land and this will further reduce the flexibility of the land as there will be fewer opportunities available for mechanised operations and a much reduced period when livestock can be carried, since either activity is likely to cause structural damage to the land during wet periods.

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SOURCES OF REFERENCE

British Geological Survey (1948) *Sheet No.255, Beaconsfield*,
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

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 DATA

Contents:

Sample location map

Soil abbreviations - explanatory note

Soil pit and soil boring descriptions (boring and horizon levels)

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	OTH:	Other
DCW:	Deciduous woodland	BOG:	Bog or marsh	SAS:	Set-Aside
HTH:	Heathland	HRT:	Horticultural crops	PLO:	Ploughed

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

4. **GLEYSPL:** 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	ST:	Topsoil Stoniness
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
EX:	Exposure				

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	FSST:	soft, fine grained sandstone
ZR:	soft, argillaceous, or silty rocks	CH:	chalk
MSST:	soft, medium grained sandstone	GS:	gravel with porous (soft) stones
SI:	soft weathered igneous/metamorphic rock	GH:	gravel with non-porous (hard) stones

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		
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	FM: firm	EH: extremely hard
VF: very friable	VM: very firm	
FR: friable	EM: extremely firm	

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

SAMPLE NO.	GRID REF	USE	ASPECT		--WETNESS--			-WHEAT-		-POTS-		M.REL		EROSN	FROST	CHEM	ALC	COMMENTS
			GRDNT	GLEY	SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT		
1	SU89609570	RGR	N	4	30		3	3A	83	-7	89	12	3A					WD 3A IMP60 SEE 1P
2	SU89509560	RGR			25	25	4	3B	99	9	104	27	2					WE 3B PLASTIC 45+
3	SU89609560	RGR			28	28	4	3B	91	1	103	26	3A					WE 3B PLASTIC 28+
4	SU89709560	RGR	NE	2	30		3	3A	66	-24	66	-11	3B					WD 3A IMP40 SEE 1P
5	SU89609550	RGR			25	55	3	3A	105	15	110	33	2					WE 3A 1P LOCATION
6	SU89559565	RGR			25		3	3A	83	-7	85	8	3A					WD 3A IMP52
7	SU89549555	RGR			25	25	4	3B	76	-14	76	-1	3A					WE 3B IMP50
1P	SU89609550	RGR			24	57	3	3A	116	26	92	15	2					WE 3A @ ASP 5

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- PED			----STONES-----			STRUCT/	SUBS	SPL	CALC					
				COL	ABUN	CONT	COL.	GLE	>2					>6	LITH	TOT	CONSIST	STR
1	0-30	MZCL	10YR42				FEW	MN		0	0	HR	5					
	30-60	HCL	10YR64	10YR56	M	D	COM	MN	Y	0	0	HR	30		M			IMP60 SEE 1P
2	0-25	MZCL	10YR42				FEW	MN		0	0	HR	3					
	25-45	C	10YR64	10YR56	C	D	COM	MN	Y	0	0	HR	0		P		Y	
	45-80	C	10YR64	10YR56	M	D			Y	0	0	HR	3		P		Y	PLASTIC
3	0-28	MZCL	10YR42				FEW	MN		5	0	HR	10					
	28-70	C	10YR64	10YR56	M	D	COM	MN	Y	0	0	HR	0		P		Y	PLASTIC
4	0-30	MZCL	10YR42				FEW	MN		0	0	HR	5					
	30-40	HCL	10YR64	10YR56	C	D	FEW	MN	Y	0	0	HR	30		M			IMP40 SEE 1P
5	0-25	MZCL	10YR42				FEW	MN		0	0	HR	2					1P LOCATION
	25-55	HCL	10YR64	10YR56	C	D	COM	MN	Y	0	0	HR	10		M			
	55-80	C	10YR64	10YR56	M	D	COM	MN	Y	0	0	HR	0		P		Y	
6	0-25	MZCL	10YR42							0	0	HR	10					
	25-52	MZCL	10YR54	10YR68	F	D				0	0	HR	10		M			IMP52 SEE 1P
7	0-25	MZCL	10YR42							0	0	HR	5					
	25-50	C	10YR64	10YR56	C	D			Y	0	0	HR	5		P		Y	IMP50
1P	0-24	MZCL	10YR42							6	0	HR	11					
	24-36	MZCL	25Y 73	10YR56	C	D			Y	0	0	HR	20		FR	M		
	36-57	HZCL	10YR64	10YR56	C	D	COM	MN	Y	0	0	HR	20	MDCSAB	FR	M	Y	
	57-120	C	10YR64	10YR56	M	D			Y	0	0	HR	0	WDCAB	FM	P	Y	Y