Cherkley Estate,
Leatherhead, Surrey
Agricultural Land Classification
Reconnaissance Survey
May, 1995

Resource Planning Team
Guildford Statutory Group
ADAS Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

CHERKLEY ESTATE, LEATHERHEAD, SURREY

INTRODUCTION

1 This report presents the findings of a reconnaissance Agricultural Land Classification (ALC) survey of 96 3 hectares of land on the Cherkley Estate near Leatherhead in Surrey The survey was carried out in May 1995

2 The survey was commissioned by the Ministry of Agriculture Fisheries and Food (MAFF) Land Use Planning Unit Reading in connection with an ad hoc planning application for a golf course development This survey supersedes previous ALC surveys on this land

3 The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group in 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 the land use on the site was a mixture of ley and permanent grassland and Set-Aside with a lot of Woodland and Non agricultural uses

SUMMARY

5 The findings of the reconnaissance 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
2	5 4	5 6
3a	2 7	2 8
3b	62 6	65 0
4	0 9	<0 1
Non agricultural	4 8	5 0
Woodland	16 3	16 9
Agric Buildings	0 4	<0 1
Urban	3 2	3 3
Total survey area	96 3	

7 The fieldwork was conducted at an average density of one borings per five hectares A total of 15 borings and 2soil pits was described

8 The agricultural land has been classified as predominantly Subgrade 3b (moderate quality) with localised areas of Grade 2 (very good quality) Subgrade 3a (good quality) and Grade 4 (poor quality) Soil droughtiness is the key limitation across the site with the majority of the soils being stony and shallow over Chalk where the soils are slightly deeper over the Chalk rock they qualify for Subgrade 3a The areas of Subgrade 3b also contain local areas of steep slopes where gradient is a limiting factor Two minor dry valley features contain deep soils in the valley bottom and these contain sufficent avaibale water to be classified as Grade 2 The two areas of Grade 4 land pinpoint areas of very steep slopes

9 There is a complicated pattern of Non-agricultural and Woodland across the site with some areas having a parkland feel to their management At a more detailed level of fieldwork more areas of Non agricultural would probably be mapped

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	
Grid reference	N/A	TQ178551	TQ180550
Altitude	m AOD	85	100
Accumulated Temperature	day°C	1423	1406
Average Annual Rainfall	mm	730	746
Field Capacity Days	days	155	148
Moisture Deficit Wheat	mm	105	103
Moisture Deficit Potatoes	mm	97	94

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 (ATO 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 there is no overall climatic limitation affecting the site There are also no significant local climatic factors the site is climatically Grade 1

Site

14 The site occupies rolling chalk topography with a number of dry valley features In parts of the site the sides of the dry valleys become steep enough to cause a gradient limitation Microrelief is not an issue on the site

Geology and soils

15 The published geological information for the site (BGS 1978) shows the entire site to be underlain by Upper Chalk

16 The published soils information for the site (SSEW 1983) shows the entire site as soils of the Newmarket 2 Association These are decsribed as shallow well drained calcareous coarse loamy and sandy soils over chalk rubble associated with well-drained deeper coarse loamy and sandy soils often in an intricate pattern

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

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 III

Grade 2

19 Deeper soils in the base of the two northern dry valleys are placed in this grade very good quality land In these units the soil resource extends to depth as represented by Pit 2 Medium silty clay loam topsoils overlie subsoils of similar texture which change into heavy silty clay loams from approximately 90 cm Soil droughtiness is the key limitation Despite the depth of soil the presence of chalk in the subsoils and the poor nature of the subsoil structure (massive) produce a limitation to the amount of water that is available for extraction by roots

Subgrade 3a

20 The one map unit of this grade good quality land was identifed in the south-east of the site which was classified in the 1989 work A soil pit in this area confirms soil droughtiness as the key limitation related to the presence of chalk at approximately 35 cm

Subgrade 3b

21 The majority of the site has been placed in this grade moderate quality land Soil droughtiness is the key limitation again related to the presence of chalk at shallow depths Pit 1 is representative of these soils Medium silty clay loam topsoils overlie a thin and very stony

distinguished from the shallow Subgrade 3a soils because they are much stonier in the upper subsoil

Grade 4

22 Two areas of this grade poor quality land were identified in the south easten section by the previous survey Gradient is the limiting factor slopes in the range 11 18 degrees were found

distinguished from the shallow Subgrade 3a soils because they are much stonier in the upper subsoil

Grade 4

22 Two areas of this grade poor quality land were identified in the south easten section by the previous survey Gradient is the limiting factor slopes in the range 11-18 degrees were found

SOURCES OF REFERENCE

British Geological Survey (1978) *Sheet No 286 Reigate*
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 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

SAMPLE NO	GRID REF	ASPECT USE		GRDNT	GLEY	-WETNESS SPL	CLASS	GRADE	WHEAT- AP	MB	-POTS- AP	MB	M REL DRT	EROSN FLOOD	FROST EXP	CHEM DIST	LIMIT	ALC	COMMENTS
1	TQ182 548	SAS	NW	03	000		1	1	063	40	063	-31	3B				DR	3B	
1P	TQ184 549	SAS	NW	02	000		1	1	069	34	070	24	3B				DR	3B	
2	TQ181 549	MCL	NW	04	000		1	1	068	-35	068	-26	3B				DR	3B	
2P	TQ182 551	LEY			000		1	1	124	21	105	11	2				DR	2	PIT90CM
3	TQ179 551	PGR			000		1	1	141	38	115	21	1					1	VALLEY
4	TQ178 552	PGR			000		1	1	151	48	114	20	1					1	VALLEY
5	TQ179 548	PGR			000		1	1	080	-23	085	-9	3B				DR	3B	
6	TQ181 547	PGR			000		1	1	000	0	000	0					DR	3B	
7	TQ183 548	SAS	NW	02	000		1	1	085	-18	090	4	3A				DR	3A	
8	TQ184 550	SAS	NW	02	000		1	1	083	-20	086	-8	3B				DR	3B	
9	TQ184 551	LEY	NW	02	000		1	1	092	-11	096	2	3A				DR	3A	
10	TQ182 553	SAS	NW	02	000		1	1	107	4	121	27	3A				DR	3A	I70FLINT
11	TQ182 551	PGR	NW	03	000		1	1	135	32	120	26	1					1	
12	TQ183 549	LEY	NW	03	000		1	1	126	23	118	24	2				DR	2	
13	TQ180 552	PGR	NW	03	000		1	1	061	-42	061	-33	3B				DR	3B	
14	TQ175 548	LEY	NW	04	000		1	1	074	29	074	-20	3B				DR	3B	
15	TQ176 549	LEY	NW	04	000		1	1	066	37	066	28	3B				DR	3B	

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL	GLEY	STONES 2	STONES 6 LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC
1	0 15	mcl	10YR43 00						2	0 HR	2						
	15 20	mcl	10YR43 00						0	0 CH	50		M				
	20 50	ch	00XX00 00						0	0	0		P				
1P	0 20	mzcl	10YR43 00						7	0 HR	10						
	20 35	mzcl	10YR54 00						0	0 CH	60		P				
	35 55	ch	05Y 81 00						0	0 HR	2		P				
2	0 20	mcl	10YR43 00						2	0 HR	2						
	20 30	mcl	10YR43 00						0	0 CH	50		M				
	30 50	ch	00XX00 00						0	0	0		P				
2P	0-24	mzcl	10YR43 00						3	0 HR	5						
	24 42	mzcl	10YR44 00						0	0 CH	20		M				
	42-90	mzcl	10YR73 00						0	0 CH	10	MASS	FR P				
	90-120	hzcl	10YR73 00						0	0 CH	10	MASS	FR P	Y			
3	0-25	mcl	10YR43 00						2	0 HR	2						
	25-50	mcl	10YR44 00						0	0 CH	5		M				
	50-60	hcl	10YR54 00						0	0 CH	5		M				
	60-120	c	10YR73 00						0	0 CH	10		M				
4	0-25	mcl	10YR43 00						2	0 HR	2						
	25-50	mcl	10YR44 00						0	0 CH	5		M				
	50-120	hcl	10YR54 00						0	0 CH	10		M				
5	0-20	mcl	10YR43 00						2	0 HR	2						
	20-35	mcl	10YR43 00						0	0 CH	50		M				
	35-65	ch	00ZZ00 00						0	0	0		P				
6	0-20	mcl	10YR43 00						2	0 HR	2						
	20-35	mcl	10YR44 00						0	0 CH	50		M				
	35 65	ch	00XX00 00						0	0	0		P				
7	0-28	mzcl	10YR43 00						0	0 HR	5						
	28 35	mzcl	10YR43 00						0	0 CH	50		M				Y
	35-65	ch	05Y 81 00						0	0 HR	2		M				
8	0 29	mzcl	10YR43 00						0	0 HR	6						
	29 40	mzcl	10YR44 00						0	0 CH	60		M				
	40 60	ch	05Y 81 00						0	0 HR	2		M				
9	0-30	mzcl	10YR43 00						0	0 HR	2						
	30 42	mzcl	10YR43 00						0	0 CH	60		P				Y
	42-72	ch	05Y 81 00						0	0 HR	2		P				Y
10	0-28	mzcl	10YR43 00						0	0 HR	5						
	28-70	mzcl	10YR54 52						0	0 HR	2		M				

SAMPLE	DEPTH	TEXTURE	COLOUR	-- MOTTLES-- COL	ABUN	CONT	PED COL	GLEY	-STONES 2	6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC
11	0 26	mzcl	10YR43 00						0	0	HR	4						
	26 45	mzcl	10YR44 00						0	0	HR	2		M				
	45 70	mzcl	10YR44 00						0	0	CH	10		M				
	70 100	mzcl	10YR73 00						0	0	CH	20		M				
12	0 30	mzcl	10YR43 00						0	0	HR	5						
	30 47	mzcl	10YR44 00						0	0	CH	5		M				
	47 90	mzcl	10YR73 00						0	0	CH	20		M				Y
13	0 25	mzcl	10YR43 00						0	0	CH	5						
	25 40	ch	05Y 81 00						0	0	HR	2		M				
14	0 26	mzcl	10YR43 00						0	0	HR	5						
	26-35	mzcl	10YR44 00						0	0	CH	60		M				
	35-50	ch	05Y 81 00						0	0	HR	2		M				
15	0-25	mzcl	10YR43 00						0	0	CH	10						
	25 30	mzcl	10YR44 00						0	0	CH	60		M				
	30-45	ch	05Y 81 00						0	0	HR	2		P				

SOIL PIT DESCRIPTION

Site Name CHERKLEY GOLF COURSE REC Pit Number 1P

Grid Reference TQ184 549

Average Annual Rainfall	730 mm
Accumulated Temperature	1423 degree days
Field Capacity Level	158 days
Land Use	Set-aside
Slope and Aspect	02 degrees NW

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0 20	MZCL	10YR43 00	7	10	HR					
20~ 35	MZCL	10YR54 00	0	60	CH				P	
35 55	CH	05Y 81 00	0	2	HR				P	

Wetness Grade 1

Wetness Class	I
Gleying	000 cm
SPL	No SPL

Drought Grade 3B

APW	069mm	MBW	34 mm
APP	070mm	MBP	-24 mm

FINAL ALC GRADE 3B
MAIN LIMITATION Droughtiness

SOIL PIT DESCRIPTION

Site Name CHERKLEY GOLF COURSE REC Pit Number 2P

Grid Reference TQ182 551

Average Annual Rainfall 730 mm
Accumulated Temperature 1423 degree days
Field Capacity Level 158 days
Land Use Ley
Slope and Aspect degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 24	MZCL	10YR43 00	3	5	HR					
24 42	MZCL	10YR44 00	0	20	CH				M	
42- 90	MZCL	10YR73 00	0	10	CH		MASS	FR	P	
90 120	HZCL	10YR73 00	0	10	CH		MASS	FR	P	

Wetness Grade 1

Wetness Class I
Gleying 000 cm
SPL No SPL

Drought Grade 2

APW 124mm MBW 21 mm
APP 105mm MBP 11 mm

FINAL ALC GRADE 2
MAIN LIMITATION Droughtiness