4004 – 050 – 89

AGRICULTURAL LAND CLASSIFICATION

LAND AT THE RUINS, THE CHERKLEY ESTATE, LEATHERHEAD

Background

The site covers approximately 16 74ha on the Cherkley Estate which lies to the south east of Leatherhead in Surrey

The site was surveyed using a 110cm Dutch auger, with samples being taken at approximately 100m intervals

Land use

At time of survey the site was in permanent grass (see Part I of report) An area in the north western corner of the site was not surveyed as it appeared to be in use for the dumping of soil

Physical Factors Affecting Land Quality

Relief

The site lies between 115m and 155m A O D and is very undulating There are some steep slopes which lead to down grading in relation to agricultural land quality Approximately 25% of the site has gradients of greater than 7 degrees

Climate

The average annual rainfall for the area varies from 762mm/annum at 115m A O D to 780mm/annum at 155m A O D Soils are at field capacity for between 161 and 164 days/annum (at 115m and 155m A O D respectively) The median accumulated temperature above 0 degrees C for January to June varies from 1389 to 1344 degree days between the lowest and highest points on the site respectively Moisture deficits adjusted for wheat range from 100mm/annum at 115m A O D to 95mm/annum at 155m A O D Adjusted for potatoes they vary between 89 and 83mm/annum

Geology and Soils

For general description see Part I of the report

Field examination of the soils found profiles to fall into a single broad group medium clay loams and silty clay loams overlying upper chalk at a range of depths Depths of subsoil vary with the depth to chalk and are composed of medium clay loam or medium to heavy silty clay loam with more or less chalky material From a pit within the site top- and subsoils were found to contain c 2% flints and c 5% were found in the chalk rock Profiles were chiefly limited by droughtiness due to shallow soils over chalk although a few areas were additionally down graded on steepness of slope which will affect the range and efficiency of mechanised operations which may be carried out

Agricultural Land Classification

Appendix 1 gives a description of the grades used for this classification

Grade 3a

This grade occupies 4 37ha (27 1% of the total agricultural area of the site) at the south of the site Profiles are typically composed of medium clay loam and silty clay loam topsoils over similar, if slightly heavier subsoils with varying amounts of chalk fragments (between 2 and 40% by volume) All profiles meet the upper chalk at around 35cm A pit within the area showed these soils to have approximately 2% flints with 5% in the chalk rock Roots were found to penetrate to 55cm The shallow depth of soil above the chalk and the presence of flints has resulted in their allocation to grade 3a on droughtiness

Grade 3b

This grade is dominant across the site occupying 10 82ha (67 2% of the total agricultural area surveyed) over the undulating north and central parts of the site Profiles are limited either by droughtiness or steepness of slope Profiles restricted by drought are found typically composed of very slightly stony medium clay loam and silty clay loam topsoils Subsoils are either medium clay loams or medium to heavy silty clay loams with some chalk fragments reaching chalk rock within 25cm, or alternatively the subsoil becomes a 50/50 or 60/40 chalk and soil mix before passing to pure chalk at depths ranging from 35cm to 45cm

Soils which are allocated to this grade due to steepness of slope are similar to those above but may be deeper over chalk They are down graded on slope as the gradients in the area are in excess of 7 degrees They form part of the north facing slope of the most southerly of two prominant valley features on the site

Grade 4

Two areas on the site are allocated this grade as gradients are in excess of 11 degrees

Areas of Grades

Total area of site	16 74ha
Areas not surveyed	0 64ha
Total agricultural area	16 1ha

Grade 3a	4 37ha(27 1% total agricultural area)
Grade 3b	10 82ha(67 2% total agricultural area)
Grade 4	0 91ha(5 7% total agricultural area)

References

British Geological Survey 1978 Sheet 286 Reigate 1 50 000

M A F F 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 1 250 000

RESOURCE PLANNING GROUP
READING R O
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CHERKLEY ESTATE, LEATHERHEAD

SCHEDULE OF AUGER BORINGS

The whole site was covered with permanent grassland, undulating with a few steep slopes

1 Slight slope <7°

0-12	(M)CL 10 YR 3/3 dark brown c2% flint	
12-25	(M)CL 10 YR 4/3 dark brown/brown c2% flints many chalk fragments-c5%	
25-45	Chalk & soil mix-predominantly chalk, dirty,fairly soft, c5% flints	
45-70+	Chalk white, crumbly From pit 1 assume rooting to 55cm	
	Drought	Grade 3a/b

1s Sloping 8° Grade 3b

2 Valley bottom, gently sloping 4°

0-12	(M)CL 10 YR 3/3 c2% flints some organic material	
12-35	(M)CL 10 YR 4/3 c10% chalk fragments c2% flints	
35-65	(M)CL 10 YR 5/4 yellowish brown, c2% flints c40% chalk	
65-75	ZCL 10 YR 5/4, c2% flint, c5% chalk	
75-100+	ZCL & chalk mix becoming dirty white chalk with depth, gritty 5% flint Assume rooting to 85cm (10cm below top of chalk)	
	Drought	Grade 2

2s Bottom of valley sides 4° Grade 2

3 Sloping valley sides 12°

0-17	ZCL 10 YR 3/3, some organic matter 2% flints	
17-35	(M)CL 10 YR 5/4 soil & chalk mix-50/50, 2% flints	
35-50	Predominantly chalk dirty gritty, 5 flint	
50+	Chalk, 5% flint Assume from pit 1 rooting to 55cm	
	Slope	Grade 4

3s Valley sides 6 5° Grade >3b

4 Gently sloping <7°

0-27	ZCL 10 YR 3/2 very dark grayish brown c2% flints, some organic matter	
27-35	(M)CL 10 YR 3/2 c2% flints, chalk & soil mix-40/60	
35-75+	Dirty chalk becoming wetter with depth, c5% flints Assume from pit 1 rooting to 55cm	
	Drought	Grade 3a

4s Sloping 12° Grade 4

5 Very slight slope 5°

0-18	(M)CL 10 YR 3/3 some organic matter, c2% flints	
18-28	(M)CL 10 YR 4/3 c2% flint c5% chalk fragments	
28-35	(M)CL as above but c10% chalk, c2% flint	
35-75	(M)CL 10 YR 5/4 soil & chalk mix-60/40, c2% flint Hard to auger from 55cm	
75+	Pure chalk c5% flints Assume rooting to 65cm (c10cm below possible depth of 70% chalk)	
	Drought	Grade 2/3a

5s Very slight slope 5° Grade >3b

6 Very slight slope 5°

0-25	(M)CL 10 YR 3/2 some organic matter 2% flints some chalk fragments-2%	
25-40	Dirty chalk c5% flints	
40+	Pure chalk c5% flints Assume from pit 1 rooting to 55cm	
	Drought	Grade 3b

6s Very slight slope 5° Grade >3b

7 Very slight slope 4°

0-23	(M)CL 10 YR 3/3, some organic matter c2% flints	
23-35	(M)CL 10 YR 4/3 c2% flints few chalk fragments c2% chalk	
35-70+	Dirty chalk wetter than previous profiles Assume from pit 1 rooting to 55cm	
	Drought	Grade 3a

7s Very slightly sloping 4° Grade >3b

8 Very slightly sloping 4°

0-12	(M)CL 10 YR 3/3 some organic matter, c2% flints
12-35	Chalk & soil mix-50/50, c2% flints
35+	Soft pure chalk 5% flints Assume from pit 1 rooting to 55cm

Drought — Grade 3a/b

8s Very slightly sloping 5° — Grade >3b

9 Very slight slope 5°

0-12	(M)CL 10 YR 3/3, some organic matter, c2% flints
12-35	Soil & chalk mix-40/60, c2% flints
35+	Dirty chalk becoming purer with depth, c5% flints Assume from pit 1 rooting to 55cm

Drought — Grade 3b

9s Very slight slope c5° — Grade >3b

10 Lower mid slope 8 5°

0-18	(M)CL 10 YR 3/3, some organic matter c2% flints
18-35	(M)CL 10 YR 4/3, c2% flints, few chalk fragments-c2%
35-55	Chalk & soil mix-50/50 10 YR 5/6 yellowish brown gritty c2% flints
55-80+	Dirty chalk, purer with depth, moist c5% flints Assume rooting to 65cm (10cm into chalk rock)

Slope — Grade 3b

10s Bottom of valley, gently sloping 5° — Grade >3b

11 Side of valley, sloping 6 5°

0-20	(M)CL 10 YR 4/3 some organic matter, c2% flints some chalk fragments-c2%
20-35	Soil & chalk mix-50/50, c2% flints
35-50+	Dirty chalk becoming purer with depth, c5% flints Assume from pit 1 rooting to 55cm

Drought — Grade 3b

11s Very slightly sloping <7° — Grade >3b

12 Very slightly sloping <7°, top of rise

0-15	(M/H)ZCL 10 YR 5/2 grayish brown some organic matter c2% flints c1% chalk
15-35	(H)ZCL 10 YR 6/3 pale brown, c2% flint c3% chalk
35-45	Chalk & soil mix-60/40, c2% flint
45-70+	Dirty white chalk, dry, crumbly, c5% flints Assume from pit 1 rooting to 55cm

Drought — Grade 3a

12s Sloping 7 5° — Grade 3b

13 Top of slope 7 5°

0-25	(M)ZCL 10 YR 4/3, c2% flint, c3% chalk
25-35	Chalk & soil mix-80/20 c5% flints
35-90+	Dirty white chalk moist, soft c5% flints Assume from pit 1 rooting to 55cm

Drought & slope — Grade 3b

13s Valley bottom, gently sloping 4° — Grade >3b

14 Bottom of slope/valley 4°

0-25	(M)ZCL 10 YR 4/3 c2% flints c3% chalk
25-35	Chalk & soil mix- 80/20, c5% flints
35-100+	Chalk-soft, dirty moist and becoming wetter Assume from pit 1 rooting to 55cm

Drought — Grade 3b

14s Valley bottom 4° — Grade >3b

15 Lower slopes

0-10	(M)ZCL 10 YR 5/2 c1% chalk, c2% flints
10-25	(H)ZCL 10 YR 5/2 c3% chalk, c2% flints
25-85+	Dirty white chalk, hard, dry moist below 40cm Assume from pit 1 rooting to 55cm

Drought — Grade 3b

15s Gently sloping, top of rise <7° — Grade >3b

16 Gently sloping

0-10	(M)ZCL 10 YR 4/3 c2% flints, root mat
10-20	(H)ZCL 10 YR 5/3 c2% flints c3% chalk
20+	Impenetrable flints c40% & chalk Assume from pit 1 rooting to 55cm

Drought — Grade 3b

16a As above

16s Gently sloping, top of slope <7° Grade >3b

17 Mid-slope <7°

0-5	(M)ZCL 10 YR 4/3 c2% flints root mat
5-27	(M/H)ZCL 10 YR 5/2 c2% flints c2% chalk
27-60+	Dirty white chalk, soft, c5% flints Assume from pit 1 rooting to 55cm

Drought Grade 3a

17s Valley side 7° Grade 3b

18 Gently sloping, top of slope <7°

0-10	(M)ZCL 10 YR 4/2 c2% flint, c2% chalk
10-50+	Dirty white chalk, difficult to auger Assume from pit 1 rooting to 55cm

Drought Grade 3b

18s Valley bottom 7° Grade 3b

19 Valley bottom, sloping 7°

0-25	(H)ZCL 10 YR 4/3 c2% flint c2% chalk root matter
25-100+	Soft, dirty chalk becoming wetter c5% flints hard to auger, possibly due to flints Assume from pit 1 rooting to 55cm

Drought & slope Grade 3b

19s Gently sloping 5° Grade >3b

20 Sloping valley side 8°

0-40	(M)ZCL 10 YR 4/1 dark gray, c2% flint
40-60	(H)CL 10 YR 7/4 very pale brown, c2% flint, c15% chalk gritty
60-65	Chalk & soil mix-80/20, gritty c5% flints
65-80+	Dirty white chalk c5% flints Assume from pit 1 rooting to 55cm

Slope Grade 3b

21 Gently sloping 5°

0-35	(M)ZCL 10 YR 4/1 c2% flint some organic matter
35-100+	Dirty white chalk, dry, crumbly, c5% flint Assume from pit 1 rooting to 55cm

Drought Grade 3a

PIT DETAILS

Pit 1

0-27	(M)ZCL 10 YR 3/2, much organic material, 2% measured flints (2-6cm)
27-35	(M)CL 10 YR 3/2, soil and chalk mix-60/40, 2% measured flints (2-6cm), moderately developed very friable/friable medium to coarse subangular blocky (GOOD)
35+	Layers of hard blocky chalk, some ochreous colours, c 5% flints-very large (>6cm), roots penetrate to 55cm

All profiles are based on this type of soil profile