

**Golf Course Application
Cruchfield Manor Farm
Hawthorn Hill
Berkshire**

**Agricultural Land Classification
Report of Survey**

**Resource Planning Team
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ADAS
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GOLF COURSE APPLICATION, CRUCHFIELD MANOR FARM, HAWTHORN HILL, BERKSHIRE

Report of Survey

1. Introduction

In October 1992, an Agricultural Land Classification (ALC) survey was carried out on 113 hectares of land near Cruchfield Manor Farm at Hawthorn Hill, north of Bracknell in Berkshire. ADAS was commissioned by MAFF to determine the land quality affected by the application for the development of a private golf course.

The work was conducted by members of the Resource Planning Team within the Guildford Statutory Group using MAFF's revised guidelines and criteria for grading the quality of agricultural land. These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose long term limitations on its use for agriculture.

The attached ALC map shows that the whole of the agricultural area has been classified as Subgrade 3b. The information is accurate at this level but any enlargement would be misleading.

The area had been surveyed previously by consultants acting on behalf of the developer and their ALC report was available before the current survey commenced. This previous information was therefore taken into account and ADAS was able to target the location of six soil pits to check the consultants' findings.

The poor quality of the land is related to the presence of layers of clay at shallow depth which are poorly structured and which significantly affect the drainage of water, causing waterlogging and affecting the flexibility of the land.

This agrees with the findings from the consultants' survey although an area which had been previously indicated as high quality land has been downgraded due to the presence of heavy topsoil textures which cause a more severe workability limitation than was initially assessed.

Table 1 : Distribution of ALC Grades

<u>Grade</u>	<u>Area (ha)</u>
3B	100.5
Non Agric	2.1
Woodland	9.9
Agric Bldgs	0.1
Urban	<u>0.9</u>
	113.5 ha

2. Climate

The climatic criteria are considered first when grading land as climate can be overriding in the sense that severe limitations will restrict land to low grades irrespective of favourable soil or site conditions.

The main parameters used in the assessment of a climatic limitation are average annual rainfall, as a measure of overall wetness, and accumulated temperature, as a measure of the relative warmth of a locality.

Detailed assessments of the prevailing climate were made for 3 representative locations on the site by interpolation from a 5 km gridpoint dataset. Details of interpolations are given in the table below. These show that there is no overall climatic limitation affecting the site; the whole area is climatically Grade 1.

Table 2 : Climatic Interpolations

Grid Reference:	SU880749	SU878743	SU885739
Altitude (m):	45	60	70
Accumulated Temperature (°days)	1468	1451	1439
Average Annual Rainfall (mm):	664	669	670
Field Capacity (days):	139	140	140
Moisture Deficit, Wheat (mm):	115	113	111
Moisture Deficit, Potatoes (mm):	109	107	105

3. Agricultural Land Classification

The whole of the agricultural area (100.5 hectares) has been classified as Subgrade 3B, moderate quality agricultural land. Four soil pits were described throughout the survey area and these cover the slight variation in soils that occur on the site. The main physical limitation common to the whole area is soil wetness. All the soils show clear evidence of gleying within the 40 cm which is directly related to the presence of poorly structured clay subsoils which are slowly permeable. Pit 1 is typical of those soils which exhibit slowly permeable layers within approximately 40 cm and are, consequently, placed in Wetness Class IV (ie. 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). These soils also have Clay topsoil textures which, in combination with the Wetness Class and the prevailing Field Capacity range (139-140 days), limits the soils to no better than Subgrade 3B. In the remaining pits, the slowly permeable layers are not present until below approximately 45 cm. The degree of wetness in these soils is less severe, they qualify for Wetness Class III (ie. the soil profile is wet within 70 cm depth for 91-180 days in most years). However, the heavy nature of the topsoil textures (Heavy Clay Loam), together with the degree of wetness still means that these soils can be graded no higher than Subgrade 3B. The topsoil textures at Pit 4 have been described as Medium Clay Loam but, adjacent borings indicated that the topsoil textures are generally heavier in this area and that Subgrade 3B is still the most appropriate classification.

The degree of wetness means that these soils are sensitive to structural damage and this therefore significantly limits the number of days when the soil is in a suitable condition for cultivation, trafficking by machinery or grazing by livestock.

Pit 2 was located in the area originally graded by the consultant as Subgrade 3A. Topsoil textures were assessed by the consultant as Medium Clay Loam, but the current survey has downgraded this section to Subgrade 3B because the topsoil textures have been assessed as Heavy Clay Loam both at the pits and at adjacent borings. Apart from this disagreement, the current survey results broadly confirm the original consultant's findings.

DESCRIPTION OF THE GRADES AND SUB-GRADES

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 include 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 and horticultural crops can usually be grown but on some land in the 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.

Grade 3 - good to moderate quality agricultural land

Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where 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 level of yields. It is mainly suited to grass with occasional arable crops (eg 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 very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

Descriptions of other land categories used on ALC maps

Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture including: housing, industry, commerce, education, transport, religious buildings, cemeteries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

Non-agricultural

'Soft' uses where most of the land could be returned relatively easily to agriculture, including: private parkland, public open spaces, sports fields, allotments and soft-surfaced areas on airports/airfields. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

Agricultural buildings

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (eg polythene tunnels erected for lambing) may be ignored.

Open water

Includes lakes, ponds and rivers as map scale permits.

Land not surveyed

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above land cover types, eg buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will usually be shown.

SOIL PROFILE DESCRIPTIONS: EXPLANATORY NOTE

(i) TEXTURE:-

Soil texture classes are denoted by the following abbreviations (all Upper case*):

S	Sand
LS	Loamy Sand
SL	Sandy Loam
SZL	Sand Silt Loam
ZL	Silt Loam
MZCL	Medium Silty Clay Loam
MCL	Medium Clay Loam
SCL	Sandy Clay Loam
HZCL	Heavy Silty Clay Loam
HCL	Heavy Clay Loam
SC	Sandy Clay
ZC	Silty Clay
C	Clay

For the sand, loamy sand, sandy loam and sandy silt loam classes the predominant size of sand fraction may be indicated by the use of prefixes, thus:

F	fine (more than $\frac{2}{3}$ of sand less than 0.2 mm)
C	coarse (more than $\frac{1}{3}$ of sand greater than 0.6 mm)
M	medium (less than $\frac{2}{3}$ fine sand and less than $\frac{1}{3}$ coarse sand)

The sub-divisions of clay loam and silty clay loam classes according to clay content are indicated as follows:-

M	medium (less than 27% clay):
H	heavy (27-35% clay)

Other possible texture classes include:

P	Peat
SP	Sandy Peat
LP	Loamy Peat
PL	Peaty Loam
PS	Peaty Sand
MZ	Marine Light Silts

* There are two exceptions to the Upper Case rule:-

- The prefix "Calc" is used to identify naturally calcareous soils containing more than 1% Calcium Carbonate
- For organic mineral soils, the texture of the mineral fraction is prefixed by "Org".

(ii) STRUCTURE:-

Nature and size of structural units are denoted by the following abbreviations:

SAB Subangular Blocky
AB Angular Blocky
P Prismatic

(single grain, granular and platy are not abbreviated)

F Fine
M Medium
C Coarse
VC Very Coarse

eg Weak MSAB = Weakly developed medium subangular blocky

(iii) OTHER

f = few = less than 2% of the matrix or surface described
c = common = 2-20% of the matrix or surface described
m = many = 20-40% of the matrix or surface described
vm = very many = +40% of the matrix or surface described

f = faint = indistinct mottles, evident only on close examination
d = distinct = although not striking, the mottles are readily seen
p = prominent = the mottles are conspicuous, and the mottling is one of the outstanding features of the horizon

gm = grey mottling
om = ochreous mottling

eg cdom = common distinct ochreous mottles

rrc = rusty root channels
ppf = pale ped faces
mn = manganese

st = stones 6 cm
sst = stones 2-6 cm
vsst = stones 2 cm

WC = Wetness Class (use Roman numerals, eg WC IV)

SPL = Slowly Permeable Layer

WT = Water Table

I = Impenetrable if used in Depth Column

IMP = Impenetrable if used in soil profile notes

(IMP 2 x 40 cm = 2 additional borings, both impenetrable at 40 cm)

ASP = Auger Sample Point

SOIL PIT DESCRIPTION

Site Name : CRUCHFIELD MANOR FM BERK Pit Number : 1P

Grid Reference: SU Average Annual Rainfall : 669 mm
 Accumulated Temperature : 1451 degree days
 Field Capacity Level : 140 days
 Land Use :
 Slope and Aspect : 01 degrees W

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 25	C	25Y 42 00	0	0	F	
25- 35	C	25Y 62 00	0	0	M	MDCSAB
35- 55	C	25Y 62 00	0	0	M	MDCAB

Wetness Grade : 3B Wetness Class : IV
 Gleying : 025 cm
 SPL : 035 cm

Drought Grade : APW : 000mm MBW : 0 mm
 APP : 000mm MBP : 0 mm

FINAL ALC GRADE : 3B
 MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : CRUCHFIELD MANOR FM BERK Pit Number : 2P

Grid Reference: SU Average Annual Rainfall : 669 mm
 Accumulated Temperature : 1451 degree days
 Field Capacity Level : 140 days
 Land Use :
 Slope and Aspect : 03 degrees NW

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 30	HCL	10YR32 00	0	1		
30- 60	C	25Y 62 63	0	4	M	MDCSAB
60- 80	C	25Y 62 63	0	0	M	WDCSAB

Wetness Grade : 3B Wetness Class : III
 Gleying : 030 cm
 SPL : 060 cm

Drought Grade : APW : 000mm MBW : 0 mm
 APP : 000mm MBP : 0 mm

FINAL ALC GRADE : 3B
 MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : CRUCHFIELD MANOR FM BERK Pit Number : 3P

Grid Reference: SU Average Annual Rainfall : 669 mm
 Accumulated Temperature : 1451 degree days
 Field Capacity Level : 140 days
 Land Use :
 Slope and Aspect : degrees NW

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 25	HCL	10YR4/2 0/0	0	0		
25- 45	C	2.5Y 6/2 0/0	0	0	M	MCSAB
45- 75	C	2.5Y 6/2 0/0	0	0	M	WCSAB

Wetness Grade : 3B Wetness Class : III
 Gleying : 0.25 cm
 SPL : 0.45 cm

Drought Grade : APW : 0.00mm MBW : 0 mm
 APP : 0.00mm MBP : 0 mm

FINAL ALC GRADE : 3B
 MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : CRUCHFIELD MANOR FM BERK Pit Number : 4P

Grid Reference: SU Average Annual Rainfall : 669 mm
 Accumulated Temperature : 1451 degree days
 Field Capacity Level : 140 days
 Land Use :
 Slope and Aspect : degrees NW

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 30	MCL	10YR3/2 0/0	0	1		
30- 60	C	2.5Y 6/2 6/4	0	2	M	MCDSAB
60- 80	C	2.5Y 6/2 6/4	0	2	M	WDCSAB

Wetness Grade : 3A Wetness Class : III
 Gleying : 0.30 cm
 SPL : 0.60 cm

Drought Grade : APW : 0.00mm MBW : 0 mm
 APP : 0.00mm MBP : 0 mm

FINAL ALC GRADE : 3A
 MAIN LIMITATION : Wetness