GOLF COURSE APPLICATION, KINGSWOOD ESTATE, BANSTEAD, SURREY

Agricultural Land Classification : Report of Survey

1. Introduction

In July 1992, an Agricultural Land Classification (ALC) was carried out on 220 hectares of land on the Kingswood Estate at Banstead in Surrey. ADAS was commissioned by MAFF to determine the land quality affected by the proposal for development of a private golf course complex comprising an 18 hole and a 9 hole course, clubhouse and associated car parking.

The survey was conducted by members of the Resource Planning Team within the Guildford Statutory Group using MAFF's revised guidelines and criteria for classifying the quality of agricultural land. These guidelines provided 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 majority of the site falls into the category of 'best and most versatile' land. The distribution of the grades and subgrades is shown on the attached ALC map and the areas of each grade are given in the table below. The information has been illustrated at a scale of 1:20,000; it is accurate at this level but any enlargement maybe misleading.

The density of observations on the agricultural land is approximately 1 per 3 hectares. A total of 55 borings and 4 soil pits was described. Soil wetness is typically the main limiting factor for the Grade 2 soils. Heavy clay layers at depth in the profile cause a degree of waterlogging which restricts the flexibility of the land. The areas of 3B pick out soils where the wetness assessment is more significant or where high stone contents restrict the flexibility of the topsoil and cause a significant droughtiness limitation. Areas of locally steep gradients are downgraded to 3B and 4.

Table 1: Distribution of Grades and Subgrades

Grade	Area (ha)	% of Agricultural Area
2	120.3	72.1
3B	38.6	23.1
4	8.0	4.8
Non Agric	1.2	100% (166.9 ha)
Woodland	38.3	
Agric Bldgs	1.4	
Urban	3.5	
TOTAL	211.3	

2. Climate

The climatic criteria are considered first when classifying land. 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 the 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.

A detailed assessment of the prevailing climate has been made by interpolation from a 5 km gridpoint dataset. The details are presented in the table below and show that there is no overall climatic limitation affecting the site. In addition, no local factor is significant. The site is climatically Grade 1.

Table 2: Climatic Interpolations

Grid Reference	TQ261572	TQ255573	TQ248581
Height (m)	180	150	165
Accumulated Temperature (°days)	1370	1347	1329
Average Annual Rainfall (mm)	762	768	744
Field Capacity (days)	161	162	156
Moisture deficit, Wheat (mm)	98	96	97
Moisture deficit, Potatoes (mm)	88	85	86

3. Agricultural Land Classification

Given the prolonged dry period which preceded the survey, many of the borings across the site could not slightly stony subsoil layers. Much of the gradings therefore depends upon the interpretation of the information gained from soil pit descriptions and applying this to surrounding areas.

3.1 Grade 2

The majority of the survey area has been placed in this grade and 3 soil pits have been described which cover the range of soils that are found in this map unit. Pits 1 and 3 describe soils with a wetness limitation.

Pit 3 has been placed in Wetness Class I. There is clear gleying from approximately 55 cm but there is no slowly permeable layer within 80 cm despite the presence of a lower clay subsoil with poor porosity. Given the topsoil texture (medium clay loam), and the prevailing Field Capacity range (156-162), this profile actually qualifies for Grade 1. Local variation in the profiles, with some heavier clay horizons however, suggests that Wetness Class II is the more appropriate Class and the soils are therefore limited to Grade 2.

Some of the local variation mentioned above is described in Pit 1. This profile has been placed in Wetness Class II as a result of deep gleying and deep slowly permeable layers, both occurring at approximately 72 cm. The top 20 cm of this profile has a lighter texture than Pit 3, described as a medium sandy silt loam, which

permits this profile to be placed in Grade 1. However, the main topsoil texture grouping for soils in this area is medium clay loam and there is therefore a slight wetness and workability limitation which also restricts these soils to Grade 2.

Pit 4 is typical of the stonier soils which occur in the north of the survey area which were consistently impenetrable to the auger at shallow depths. When the pit was excavated, it was clear that the soil resource extended to at least 80 cm. This pit describes a soil with a medium clay loam topsoil texture with just over 5% stones greater than 2 cm. Stone contents in the upper subsoil of heavy clay loam are only approximately 7% (but this by itself is enough to stop the auger) and approximately 2% in the lower subsoil of clay. These soils showed no evidence of gleying or slowly permeable layers and are therefore placed in Wetness Class I (ie, the soil profile is not wet within 70 cm depth for more than 30 days in most years).

3.2 Sub-grade 3B

A small area of this grade has been mapped in the centre of the survey area where definite slowly permeable layers occur at shallow depths causing a significant soil wetness and workability limitation.

Pit 2 is typical of the 3B soils which occur in the south of the survey area, downgraded due to a high topsoil stoniness limitation. Immediately below a thin surface horizon, the percentage of stones greater than 2 cm is in the 15-20% range.

Gradients in the area are also in the 3B range (11-18°).

3.3 Grade 4

Two areas of this grade have been mapped in the south where gradients are locally steep (18-25°) and a disturbed former tip in the north of the area has also been placed in this grade.

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 an 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: golf courses, 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 PIT DESCRIPTION

Site Name : KINGSWOOD ESTATE, SURREY Pit Number : 1P

Grid Reference: TQ24905790
Average Annual Rainfall : 744 mm
Accumulated Temperature : 1335 degree days
Field Capacity Level : 158 days
Land Use : Permanent Grass
Slope and Aspect : degrees SE

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 19	MSZL	10YR42 00	0	1		
19- 50	SCL	10YR44 00	0	0		MD CSB
50- 72	MSL	10YR46 00	0	0		WKMCSB
72-120	C	75YR56 00	0	0	C	WK CSB

Wetness Grade : 1
Wetnesss Class : II
Gleying :072 cm
SPL :072 cm

Drought Grade : 1
APW : 140mm MBW : 41 mm
APP : 112mm MBP : 24 mm

FINAL ALC GRADE : 1
MAIN LIMITATION :

SOIL PIT DESCRIPTION

Site Name : KINGSWOOD ESTATE, SURREY Pit Number : 2P

Grid Reference: TQ25955742
Average Annual Rainfall : 744 mm
Accumulated Temperature : 1335 degree days
Field Capacity Level : 158 days
Land Use : Permanent Grass
Slope and Aspect : 02 degrees S

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 8	HCL	10YR44 00	0	0		
8- 30	HCL	10YR44 00	20	45		WK FSB

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

Drought Grade : 4
APW : 41 mm MBW : -58 mm
APP : 41 mm MBP : -47 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Topsoil Stoniness

SOIL PIT DESCRIPTION

Site Name : KINGSWOOD ESTATE. SURREY Pit Number : 3P

Grid Reference: TQ

Average Annual Rainfall : 744 mm
Accumulated Temperature : 1335 degree days
Field Capacity Level : 158 days
Land Use : Permanent Grass
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 27	MCL	10YR43 00	0	2		
27- 42	MCL	10YR44 00	0	2		MCSAB
42- 55	HCL	75YR46 00	0	0		MDCSB
55-100	C	75YR46 00	0	0	C	MDCSB

Wetness Grade : 1

Wetness Class : 1
Gleying :055 cm
SPL : No SPL

Drought Grade : 2

APW : 125mm MBW : 26 mm
APP : 116mm MBP : 28 mm

FINAL ALC GRADE : 1
MAIN LIMITATION :

SOIL PIT DESCRIPTION

Site Name : KINGSWOOD ESTATE. SURREY Pit Number : 4P

Grid Reference: TQ

Average Annual Rainfall : 744 mm
Accumulated Temperature : 1335 degree days
Field Capacity Level : 158 days
Land Use : Wheat
Slope and Aspect : 02 degrees S

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 28	MCL	10YR42 00	5	5		
28- 55	HCL	10YR44 00	0	7		MDCSB
55- 80	C	75YR54 00	0	2	C	MDMSB

Wetness Grade : 1

Wetness Class : 1
Gleying : cm
SPL : No SPL

Drought Grade : 2

APW : 105mm MBW : 6 mm
APP : 112mm MBP : 24 mm

FINAL ALC GRADE : 2
MAIN LIMITATION : Droughtiness