8FS3652 10/90

LAND AT WHITEWAY LANE, MARNHULL, DORSET
AGRICULTURAL LAND CLASSIFICATION AND SITE PHYSICAL CHARACTERISTICS

REPORT OF SURVEY

1. Introduction

In May 1990 the Resource Planning Group (South West Region) carried out a detailed Agricultural Land Classification and site physical characteristics survey on a 1 ha site at Whiteway Lane, Marnhull. The site is proposed for the extraction of stone, and the survey was carried out in order to meet MAFFs statutory role under the Town and Country Planning Act, 1971, to provide a statement of the land quality and site physical characteristics.

The soil was examined by hand auger at 4 points, and a pit was dug and described. The entire site was classified as sub-grade 3b under the revised guidelines and criteria for grading the quality of agricultural land (1988).

2. Climate

Estimates of the relevant climatic variables were obtained by interpolation from a five kilometre grid database, and are given below:

Altitude	:	60 m
Accumulated Temperature	:	1500° days
Average Annual Rainfall	:	811 mm
Field Capacity Days	:	175 days
Moisture Deficit (wheat)	:	108 mm
Moisture Deficit (potatoes)	:	101 mm

The variables used in the assessment of an overall climatic limitation are the accumulated temperature and the average annual rainfall. The accumulated temperature is a measure of the relative warmth of a locality and the average annual rainfall is a measure of the overall wetness. The values for the site show that overall climate is not a limiting factor.

The field capacity days determine the influence of climate on soil wetness and workability. These are significant limitations at this site.

The moisture deficits are used in the calculation of the droughtiness limitation. Droughtiness was not found to be a limitation.

3. Agricultural Land Classification

The entire site was classified as sub-grade 3b. This is defined as "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".

The soils were downgraded to 3b on the basis of wetness. The soil pit revealed a slowly permeable layer from 28 cm deep, which with an average of 175 days at or above field capacity gives a wetness class of IV. Soils with a wetness class of IV and a silty clay topsoil suffer from both wetness within the rooting zone, and workability constraints, which lead to the 3b grading.

The soil pit description is given as an appendix.

4. Site Physical Characteristics

Topsoil Resource: 'Topsoil' is defined as the darker, more organic-rich surface horizon of silty clay. The average depth is 30 cm. Over the survey area of 1 ha this gives a total topsoil resource of 3,000 m^3.

Subsoil Resource: 'Subsoil' is defined as the non-organic-rich lower horizons of clay and silty clay. Both of these classes are included in the same unit. There is therefore a single unit of subsoil throughout the site which may be stripped from the base of the topsoil layer (30 cm deep) to the rock, which occurs at an average depth of 95 cm. The thickness of the subsoil is therefore 65 cm, which over the survey area of 1 ha gives a total subsoil resource of 6,500 m^3.

Resource	Texture	Depth	Thickness	Area	Volume
Topsoil	ZC	0-30 cm	30 cm	1 ha	3,000 m^3
Subsoil	ZC/C	30-95 cm	65 cm	1 ha	6,500 m^3

5. Soil Handling

The topsoil and subsoil resources should be stored separately. In order to avoid the risk of contamination, the topsoil should be stored on topsoil, and the subsoil on top of subsoil. All stripping and soil handling must take place under dry conditions to minimise structural damage. The maximum height of the storage heaps should not exceed 7 metres for the topsoil, and 10 metres for the subsoil.

Given the high clay contents of both the topsoil and the subsoil, poor handling will result in a deterioration of the soil structure. This would lower the agricultural potential of the site upon re-instatement, such that the site would not be restored to its preworking agricultural land class.

APPENDIX

Soil Pit Descriptions

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	commom	=	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	disinct	=	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

DESCRIPTION OF THE GRADES AND SUBGRADES

The ALC grades and subgrades are described below in terms of the types of limitation which can occur, typical cropping range and the expected level and consistency of yield. In practice, the grades are defined by reference to physical characteristics and the grading guidance and cut-offs for limitation factors in Section 3 enable land to be ranked in accordance with these general descriptions. The most productive and flexible land falls into Grades 1 and 2 and Subgrade 3a and collectively comprises about one-third of the agricultural land in England and Wales. About half the land is of moderate quality in Subgrade 3b or poor quality in Grade 4. Although less significant on a national scale such land can be locally valuable to agriculture and the rural economy where poorer farmland predominates. The remainder is very poor quality land in Grade 5, which mostly occurs in the uplands.

Descriptions are also given of other land categories which may be used on ALC maps.

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 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: 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.

Woodland

Includes commercial and non-commercial woodland. A distinction may be made as necessary between farm and non-farm woodland.

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.

SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Whiteway Lane, Marnhull	1	1°	Cereals	Av Rainfall :- 811 ATO :- 1500 FC Days :- 175 Climatic grade:- 1	Limestone
	DATE 24/5/90	GRID REFERENCE ST 795179			

Horizon Number	Lowest Av Depth	Matrix and Ped Face Colours	Texture	Stoniness: Size, Shape, Type, and Field Method	Mottling Abundance, Contrast Size and Colour	Structure: Development Size and Shape	Pores and Fissures	Structural Condition	Consistence	Roots Abundance Size and Nature	Calcium Carbonate Content	Mangan Concs etc	Horizon Boundary: Distinctness and Form
1	28 cm	10YR4/4	HZCL	-	-	Coarse Moderate Granular	> .5	Good	Friable	Many	Yes	-	Clear Smooth
2	48 cm	10YR4/6 (Ped Faces 10YR5/3)	C	-	fdom	Coarse Strong prismatic breaking to crs strong angular blocky	< .5	Poor	V Firm	Few	Yes	-	Clear Smooth
3	94 cm	10YR5/6 (Ped faces 10YR5/3)	ZC	-	cdom	Coarse Strong prismatic breaking to crs strong angular blocky	< .5	Poor	V Firm	Few	Yes	-	Sharp Smooth
4	-	-	ROCK	-	-	-	-	-	-	-	-	-	-

Depth to Slowly Permeable Horizon :- 28 cm

Wetness Class :- IV

Wetness Grade :- 3b

RPG0023/WJC

Available Water Wheat :- N/A

Potatoes :-

Moisture Deficit Wheat :- 108

Potatoes :- 101

Moisture Balance Wheat :- N/A

Potatoes :-

Droughtiness Grade :- 1

Final ALC Grade :- 3b

Main Limiting Factor(s) :- Wetness

Remarks :-