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## AGRICULTURAL LAND CLASSIFICATION

FALMOUTH TO A30 LINK - A393 CORRIDOR: LANNER

## Report of survey

## 1. INTRODUCTION

- 1.1 Over three hundred hectares of land around Lanner and Penance were graded using the Agricultural Land Classification (ALC) System in October 1992 and January 1993. The survey was carried out for MAFF as part of its statutory role in response to the feasibility study for the A393 Corridor being carried out by Cornwall County Council.
- 1.2 The fieldwork was carried out by ADAS's Resource Planning Team (Wessex Region) at a scale of 1:10,000 (approximately one sample point every hectare). The information is correct at the scale shown but any enlargement would be misleading. This survey supercedes the 1" to the mile ALC map of the area being at a more detailed level and carried out under the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF 1988). A total of 130 borings and 3 soil pits were examined.
- 1.3 The ALC provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. The grading takes account of the top 120 cm of the soil profile. A description of the grades used in the ALC System can be found in the appendix.
- 1.4 The distribution of ALC grades identified in the survey area is detailed below and illustrated on the accompanying map.

Table 1 Distribution of ALC grades: A393 Corridor

Grade	Area (ha)	% of Survey Area	% of Agricultural Land
2	10.0	3.0	4.5
3A	163.4	49.7	73.9
3B	42.8	13.2	19.3
4	5.0	1.5	<u>2.3</u>
Non Agri	58.3	17.7	100% (221.2 ha)
Urban	44.4	13.5	
Agric Bdgs	<u>4.6</u>	<u>1.4</u>	
TOTAL	328.5	100%	

## 2. CLIMATE

- 2.1 The grade of the land is determined by the most limiting factor present. The overall climate is considered first because it can have an overriding influence on restricting land to lower grades despite other favourable conditions.

- 2.2 To assess any overall climatic limitation, estimates of important climatic variables for the site were interpolated from the published Agricultural Climatic Dataset (Meteorological Office 1989). The parameters used for assessing climate are accumulated temperature, (a measure of the relative warmth of a locality) and average annual rainfall, (a measure of overall wetness). The results shown in Table 2 indicate that the whole site is affected by a grade 2 climatic limitation.

Climatic data on Field Capacity Days (FCD) and Moisture Deficits for Wheat (MDW) and Potatoes (MDP) are also shown. This data is used in assessing the soil wetness and droughtiness limitations referred to in Section 5.

- 2.3 Evidence of exposure was noted on higher ground. However, this is not an overriding limiting factor.

Table 2 Climatic Interpolations: A393 Corridor

Grid Reference	SW735388	SW707393
Height (m)	65	190
Accumulated Temperature ( $^{\circ}$ days)	1577	1435
Average Annual Rainfall (mm)	1178	1241
Overall Climatic Grade	2	2
Field Capacity (Days)	230	238
Moisture Deficit, Wheat (mm)	88	70
Potatoes (mm)	77	53

### 3. RELIEF

- 3.1 The survey area crosses the two sides of the Cannon River Valley. The eastern part of the road corridor is gently undulating with a gradual rise from 65 m AOD in the most south easterly corner to a height of over 100 m AOD at Burnloose. From here the north facing slopes comprise steep slopes (often over 11 degrees), whilst the south facing slopes of the valley are predominantly gentler. The maximum altitude at the most northerly point of the site is 220 m AOD.

### 4. GEOLOGY AND SOILS

- 4.1 The published 1:50,000 scale solid and drift geology map sheet 352 (Geological Survey of England and Wales 1974) indicates the majority of the survey area to be underlain by Mylor slates and sandstones, with a band of alluvium in the Cannon River Valley. In addition, there is a narrow band of Elvan or Quartz Porphyry north of the alluvium.

- 4.2 The Soil Survey of England and Wales mapped the soils of the area in 1983, at a reconnaissance scale of 1:250,000. This map indicates the majority of the site to comprise Moretonhampstead Association\*. The most northerly part of the site above 100 m AOD comprise Moorgate Soils\*\* and the south eastern part of the site (south of Gwennap) comprises Denbigh 2 Association\*\*\*.
- 4.3 The recent field survey revealed the majority of the soils to comprise deep medium clay loams with some heavy clay loam subsoils in the east and silty clay loam subsoils in the north. Stone contents of the subsoil were variable, reaching a maximum of 54% hard rock to the east of the survey area, as measured in a soil pit. The stones were mostly between 2 mm and 2 cm. However, to the west of the corridor the lithology was slate. The soils are typically free draining but in the lower parts of the valley gleying in some subsoils was observed.

## 5. AGRICULTURAL LAND CLASSIFICATION

- 5.1 The distribution of ALC grades identified in the survey area is detailed in Section 1 and shown on the accompanying ALC map. The information is correct at the scale shown but any enlargement would be misleading.

### 5.2 Grade 2

A small area north-west of Lanner Moor Terrace is classed as Grade 2. The soils within this Grade have medium sandy silty loam topsoils and well drained subsoils. The soils show no evidence of wetness and are thus placed in Wetness Class I. The combination of this topsoil texture and high Field Capacity value (238 days) means the soils can be graded no better than Grade 2 with a workability limitation. This affects the timing of cultivation and grazing. The soils become stonier with depth and consequently experience a slight droughtiness limitation.

### 5.3 Subgrade 3A

The majority of agricultural land within the corridor has been classed as Subgrade 3A. The soils of this Subgrade have medium clay loam topsoils, and well drained subsoils. Consequently, they are placed into Wetness Class 1.

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- \* Moretonhampstead - Well drained gritty loamy soils with a lumose surface horizon in places, some steep slopes. Boulders and rock locally.
- \*\* Moor gate - Well drained lumose gritty loamy soils. Occasionally with thin ironpan. Many steep slopes often bouldery or rocky.
- \*\*\* Denbigh 2 - Well drained fine loamy soils over slate or slate rubble. Some fine loamy soils variably affected by groundwater.

However, the combination of topsoil texture and a high field capacity value means the soils can be graded no better than Subgrade 3A with a workability limitation. Some of these soils become stonier with depth (reaching a maximum of 35% as measured in a soil pit) imposing a slight droughtiness limitation.

#### 5.4 Subgrade 3B

Soils within the survey area have been classified as Subgrade 3B for one of three reasons. Firstly, slopes with gradients between 7-11 degrees are limited because the versatility of the land used is reduced since the range of machinery that can be safely used is restricted. Secondly, soils around Comford in and to the east of Burnloose are classed as 3B with a moderately severe wetness limitation. These soils experience impeded drainage as indicated by gleying below 40 cm and are assessed as Wetness Class II and III. Soils of these Wetness Classes with medium clay loam topsoils in an area of high field capacity days are classed as Subgrade 3B. Finally, some soils below Comford are Subgrade 3B due to a workability limitation. These are free draining soils (Wetness Class I) with heavy clay loam topsoils.

#### 5.5 Grade 4

A small region of the survey area has been classed as Grade 4. The gradient in this area is greater than 11 degrees, thus restricting use of certain types of machinery and increasing risk of soil erosion during cultivation.

## REFERENCES

GEOLOGICAL SURVEY OF ENGLAND AND WALES (1974). Solid and Drift edition. Sheet 352 Provisional 1:50,000 scale.

MAFF (1988). Agricultural Land Classification of England and Wales (Revised Guidelines and Criteria for grading the quality of land). Alnwick.

METEOROLOGICAL OFFICE (1989). Published climatic data extracted from the agroclimatic dataset, compiled by the Meteorological Office.

SOIL SURVEY OF ENGLAND AND WALES (1983). Sheet 5 Soils of South West England 1:250,000 scale.

## APPENDIX

### 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.