# PROOF OF EVIDENCE

## AGRICULTURAL LAND CLASSIFICATION
## FOUR WENTWAYS

TOWN & COUNTRY PLANNING ACT 1990

CAMBRIDGE SUB-REGIONAL SHOPPING CENTRE
PUBLIC INQUIRY

# PROOF OF EVIDENCE

by

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on behalf of
MINISTRY OF AGRICULTURE FISHERIES & FOOD

in respect of land at

FOUR WENTWAYS

MAFF
Resource Planning Group
CAMBRIDGE REGIONAL OFFICE

September 1991

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## 1.0 INTRODUCTION

1.1 My name is Katherine Anne Jewson. I am a Senior Research Officer at the Eastern Region of the Ministry of Agriculture, Fisheries and Food. I have a BA (Honours) Degree in Geography and Economics awarded by the University of Lancaster. I have been employed by the Ministry of Agriculture for eight years and have worked at the Ministry's Regional Offices in Leeds and Cambridge. Throughout this time a large proportion of my work has been concerned with the classification of agricultural land for land use planning purposes.

## 2.0 PLANNING CONSULTATION

2.1 I am attending this inquiry at the request of my colleague Mr Alasdair Sellers to provide information on agricultural land quality at the Four Wentways site, which I surveyed in September 1990. The results of this survey are summarised as follows:

## 3.0 AGRICULTURAL LAND CLASSIFICATION

3.1

| ALC | Ha | % |
|---|---|---|
| 3a | 23.1 | 45.5 |
| 3b | 26.2 | 51.1 |
| Non Agricultural | 2.0 | 3.9 |
| Total | 51.3 | 100.0 |

3.2 Details of the MAFF Agricultural Land Classification system, the methodology used, and the chief limitations to agricultural land quality are provided in sections 4.0 and 7.0 of this proof.

## 4.0 THE MAFF AGRICULTURAL LAND CLASSIFICATION SYSTEM

4.1 The MAFF Agricultural Land Classification (ALC) system assesses land quality based on its long term physical potential. Land is assigned to an ALC grade according to the degree to which its inherent physical characteristics impose long term limitations on agricultural use.

4.2 The main physical factors which are taken into account in assessing ALC grade are climate, site and soil. These may act singly, or in combination to result in varying degrees of constraint on agricultural use. The ALC grade is determined by the most limiting factor present.

4.3 Five main grades of land are recognised ranging from grade 1 land of excellent quality to grade 5 land of very poor quality. Other issues, such as the location of farms, the standard of fixed equipment and the accessibility of land do not affect grading although they may influence land use decisions. The definitions of the five Agricultural Land Classification grades are included in Annex 1.

## 5.0 BACKGROUND TO THE FOUR WENTWAYS SITE

5.1 Land on this 51 hectare site was inspected during early September 1990, in connection with proposals to construct a sub-regional shopping centre. A total of 51 soil inspections were made on site at 100 metre intervals, supplemented by information on stone volumes and root penetrations from four deep soil profile pits. At the time of survey the land was under cereal stubble.

## 6.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

### 6.1 Relief

The site has an overall south westerly aspect. From a maximum altitude of approximately 46 m near "The Grange", the land dips and falls over gentle gradients to a minimum altitude of approximately 30 m alongside the A604. Neither altitude nor relief constitute limiting factors to agricultural land quality.

6.2 Climate

Site specific climate data was obtained from the 5 km grid agroclimatic dataset produced by the Meteorological Office. (Met Office 1989). This shows average annual rainfall to be approximately 580 mm (23.2 inches) which is low by national standards. Soils are likely to be at field capacity for a relatively short period of approximately 103 days between mid March and mid December. During this time the workability of the land is not likely to be significantly impaired due to the generally free draining nature of the chalk substrate.

6.3 The accumulated temperature for this area is approximately 1426° Celsius. This parameter indicates the cumulative build up of warmth available for crop growth and has an influence on the development of soil moisture deficits (SMD)*. Soil moisture deficits of 117 mm and 112 mm are recorded for wheat and potatoes respectively. In order to counter the effects of these deficits (in terms of drought stress in crops), it is necessary for soils to hold reserves of plant available water.

Geology & Soils

6.4 The geology of this area is shown on the 1:63,360 scale drift edition geology map sheet number 205, which shows the entire site to be comprised of Cretaceous Middle Chalk. (Geol Surv; 1952)

6.5 Published soils maps indicate the existence of Newmarket and Swaffham Prior soils on site (SSEW, 1986 and SSEW, 1968). Detailed field survey observations broadly confirm these findings indicating the existence of generally shallow soils over weathered chalk on the higher ground, and slightly deeper stoneless to moderately stony soil over weathered chalk or rubbly,chalky drift** elsewhere. The drainage status of soils on site was assessed as predominantly wetness class I.

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* SMD represents the balance between rainfall and potential evapotranspiration occurring during the growing season. For ALC purposes the soil moisture deficits developing under a winter wheat and maincrop potato cover are considered. These 'reference' crops have been selected because they are widely grown and in terms of their susceptibility to drought are representative of a wide range of crops.

** comprising weathered chalk stones in a pale sandy matrix, which may contain inclusions of overlying soil material,

## 7.0 AGRICULTURAL LAND CLASSIFICATION

7.1 The site is graded 3a and 3b. The chief limitation to agricultural land quality is droughtiness. The relative severity of this limitation depends on the depth, texture and stone content of the soil profile and the degree to which roots are able to penetrate the underlying weathered chalk or rubbly, chalky drift. Soil pit observations across the site indicate that root penetration occurs to an average depth of 80 cm within the rubbly chalky drift or weathered chalk, although on the higher ground near "The Grange", the chalk was particularly deeply fissured and a few roots were observed to depths of 100 cm.

Grade 3a

7.2 This occurs in areas of gently sloping ground around the centre of the site. Profiles are relatively stone free and comprise sandy loam, or less frequently sandy silt loam and sandy clay loam textures overlying rubbly, chalky drift at approximately 40 cm, which subsequently overlies weathered chalk below approximately 60-80 cm depth. Occasional profiles of deep well bodied sandy loams occur, which are, or approach grade 2, but these are too inextensive to delineate separately. The land is limited by droughtiness imperfections.

Grade 3b

This occurs in two main situations

7.3 To the north, north-east and east of the site 3b is mapped in areas of shallow soils over chalk. Typical profiles are free draining and comprise slightly to moderately chalky medium clay loam or sandy silt loam textures to 28-35 cm depth, over weathered chalk. Although deeply fissured and penetrated by plant roots, this chalk holds relatively low reserves of plant available water. Consequently the land remains limited by moderate droughtiness imperfections.

7.4 To the south-west of the site the area mapped as 3b comprises stonier and slightly shallower variants of those described in paragraph 7.2. Typically profiles are slightly to moderately stony (comprising flints and chalk) and overlie weathered chalk, or more frequently, deep deposits of rubbly,chalky drift at 35-40 cm. Although deeper and or less stony profiles continue to occur within this mapping unit which are, or approach 3a, they are too extensive to delineate separately. The land is limited by moderate droughtiness constraints. These derive from the presence of flints, and from the less well structured, less water retentive nature of the rubbly chalky drift substrate.

Non Agricultural

7.5 This comprises predominantly broad leaved woodland.

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## SOURCES OF REFERENCE

GEOLOGICAL SURVEY (1952). 1:63,360 scale drift edition geological sheet number 205.

MAFF (1988). Revised guideline and criteria for grading the quality of agricultural land.

METEOROLOGICAL OFFICE (1989). Climatological data for Agricultural Land Classification.

SOIL SURVEY OF ENGLAND AND WALES (1968). 1:63,360 scale soil map sheet number 148.

SOIL SURVEY OF ENGLAND AND WALES (1986). 1:25,000 scale soils in Cambridgeshire III. TL 54 (Linton).

ANNEX 1

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 will affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. When more demanding crops and 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, 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 yield of which are variable. In most 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.