

**WILMINGTON, NEAR DARTFORD, KENT  
AGRICULTURAL LAND CLASSIFICATION  
RECONNAISSANCE SURVEY  
MARCH 1992**

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1. **INTRODUCTION**

- 1.1 Land on this 157.4 ha site was inspected in March 1992 in connection with proposals to develop the land as a golf course. A reconnaissance survey was undertaken in order to provide a broad appreciation of the extent and distribution of the Agricultural Land Classification (ALC) grades on the site.
- 1.2 The survey was conducted by members of the Resource Planning Team, ADAS Reading as an observation density of approximately one boring every 4 ha. The land was graded in accordance with the published MAFF guidelines and criteria (MAFF, 1988) 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.
- 1.3 The distribution of the ALC grades is shown on the accompanying coloured plan and the area and extent of the grades is summarised in the table below. The map has been drawn at a scale of 1:10,000. It is accurate at this scale, but any enlargement may be misleading.

<u>Grade</u>	<u>Area (ha)</u>	<u>% Agricultural Land</u>
2	72.7	48
3a	51.9	35
3b	26.2	<u>17</u>
Non ag/Urban	<u>6.6</u>	100
Total area of site	<u>157.4</u>	

- 1.4 At the time of survey the majority of the land was in arable use.
- 1.5 A general description of the grades and land-use categories identified in this survey is provided as an appendix. The grades are described in terms of the type of limitation that can occur, the typical cropping range and the expected level and consistency of yield.
- 1.6 Land on the site is predominantly graded 2, 3a and 3b with small areas of woodland, non-agricultural and urban land in the vicinity of Rowhill Grange and Rowhill Wood at the western end of the site.

The principal limitation to agricultural land quality on the site is that of soil droughtiness. The severity of the limitation varies according to the relative depths of soil over chalk, the textural characteristics of the soil and profile stoniness. In this dry climate regime very shallow soils over chalk have been assigned to sub-grade 3b, whilst deep, stoneless profiles are typically graded 2.

Less significantly, soil wetness and/or workability or topsoil stone contents act as a limitation across localised parts of the site.

## 2 PHYSICAL FACTORS AFFECTING LAND QUALITY

### Climate

- 2.1 Estimates of climatic variables relevant to the assessment of land quality were obtained by interpolation from a 5 km grid database (Met. Office, 1989) for representative locations in the survey area:-

### Climatic Interpolation

Grid Reference	TQ 542710	TQ 538713	TQ 526711
Altitude (m AOD)	30	50	65
Average Annual Rainfall (mm)	603	607	607
Accumulated Temperature (°days, Jan-June)	1471	1448	1431
Field Capacity Days	118	118	118
Moisture Deficit, wheat (mm)	122	119	116
Moisture Deficit, potatoes (mm)	118	115	111

- 2.2 Climatic factors place no limitation on land quality at this locality but do affect the interaction of soil factors with climate to influence soil wetness and droughtiness limitations. The climate of the area is comparatively dry in a national context.

### Relief

- 2.1 The altitude of the site varies from about 25 m AOD in the southeast to around 75 m AOD in the extreme southwest around Rowhill Grange. In general terms the land falls gently away from this high point towards the north and east, although it falls more steeply towards the dry valley at Clement Street at the southeast corner where maximum gradients of 5-6 degrees were measured.

### Geology and Soils

- 2.4 The published 1:50,000 scale geological map sheet for the site (British Geological Survey, 1977 sheet 271 - Dartford) maps the majority of the site as Upper Chalk with exposures of Thanet Beds around Rowhill Grange and immediately adjoining the built up area of Wilmington, where a small extent of Boyn Hill terrace gravel drift is also indicated.
- 2.5 The soil map of England and Wales (Soil Survey of England and Wales, 1983 sheet 6, 1:250000 scale) indicates the site as the Frilsham soil association which is described in the accompanying legend as "Well drained mainly fine loamy soils over chalk, some calcareous. Shallow calcareous fine loamy and fine silty in places" (SSEW, 1983).
- 2.6 Detailed field inspection of the soils on the site indicates that the majority comprise varying depths of loamy and clayey drift over chalk. Most soils are well drained, although occasional profiles are affected by drainage imperfections.

### 3. AGRICULTURAL LAND CLASSIFICATION

3.1 The ALC grading of the survey area is primarily determined by the interaction between soil and climatic factors. Grades 2, 3a and 3b have been mapped on the basis of soil droughtiness and/or soil wetness and workability limitations. Most of the land is principally affected by varying degrees of soil droughtiness.

#### 3.2 Grade 2

Land of very good quality has been assigned to 48% of the total agricultural land surveyed. It occurs in two situations.

- Across the dry valley north of Clement Street, fine sandy soils occur which tend to be deep and well drained. Profiles comprise very slightly stony, (3 - 7% total flints by volume) fine sandy loam or sandy clay loam topsoils which are typically calcareous. These overlie subsoils of similar texture which tend to become more stony with depth and may contain 5 - 50% flints by volume. Soils are assigned to wetness class I but suffer slight soil droughtiness problems due to the combination of sandy textures, subsoil stoniness and relatively high moisture deficits.
- The remaining areas of grade 2 land are associated with loamy and clayey drift soils developed over chalk deposits. The majority are well drained, being limited by slight droughtiness and/or workability. Occasional profiles are less well drained and are thereby limited by soil wetness. Profiles typically comprise medium, or occasionally heavy clay loam topsoils which are usually calcareous and contain between 2 and 6% flints by volume. Sandy clay loam, heavy clay loam or clay textures are found in the subsoil. A number of profiles extend to depth and may contain up to 20% flints by volume. These soils are mainly limited by slight droughtiness, although, occasionally, slightly impeded drainage may arise due to slowly permeable clay below about 48 cm depth. In this case, wetness II is appropriate and land is limited by slight wetness as well as droughtiness. The remaining profiles pass to chalky horizons (ie., 50% + chalk) and chalk at variable depths greater than 70 cm. These are limited by slight droughtiness resulting from a reduced water capacity available for plant growth.

#### 3.3 Grade 3a

Good quality agricultural land has been mapped across 35% of the land surveyed. The factors affecting the quality of this land are similar to those described above for grade 2 land, but the limitations are more pronounced.

Two different situations are represented by land graded 3a.

- Across the centre of the eastern site and towards the north of the western site, the main limitation to land quality is that of soil wetness. Topsoils of medium, heavy or sandy clay loam contain between 1 and 20% total flints by volume (<15% >2 cm) and may be calcareous or non-calcareous. These pass to similar textures or clay in the subsoil and may become chalky at depths below 70 - 80 cm. Profiles are gleyed and slowly permeable from 28 - 35 cm and are therefore assigned to wetness III. Grade 3a is thus appropriate given the soil drainage status and climatic regime.

- The remaining soils assigned to grade 3a are principally affected by soil droughtiness, although occasional profiles may be limited to a lesser extent by soil wetness and/or workability restrictions. Profiles comprise medium or heavy clay loam, or occasionally, medium silty clay loam topsoils which are typically calcareous and may contain up to 8% flints and/or chalk by volume. Subsoils of similar texture or clay tend to pass to chalky horizons (50% + chalk) or chalk at variable depths greater than about 40 - 60 cm. Plants were able to root up to 40 cm into the chalk substratum. Nevertheless, water for crop growth is restricted giving rise to a soil droughtiness risk such that grade 3a is appropriate.

#### 3.4 Grade 3b

Land of moderate quality is associated with shallow chalky soils whose agricultural use is limited by a significant risk of soil droughtiness.

Calcareous topsoils of medium clay loam or medium silty clay loam containing 2 - 5% total flints and 2 - 15% chalk by volume, overlie chalky horizons (ie., greater than 50% chalk) or chalk impenetrable to soil auger from 25 - 35 cm depth. These soils are well drained, wetness class I, but have severely restricted reserves of available water due to relatively shallow rooting. This interacts with a dry climatic regime to cause significant soil droughtiness.

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## **SOURCES OF REFERENCE**

- British Geological Survey (1977), Sheet 271, Dartford, 1:50,000.
- MAFF (1988) Agricultural Land Classification of England and Wales : Revised guidelines and criteria for grading the quality of agricultural land.
- Meteorological Office (1989) Climatic datasets for Agricultural Land Classification.
- Soil Survey of England and Wales (1983) Sheet 6, Soils of South-East England, 1:250,000 and accompanying legend.