

Cambis 24/90

AGRICULTURAL LAND CLASSIFICATION

ALLINGTON

1.0 INTRODUCTION

1.1 Agricultural Land Classification (ALC) assesses land quality based on its long term physical potential. The ALC system grades land according to the degree to which its inherent physical characteristics impose long term limitations on agricultural use.

1.2 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.

1.3 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.

2.0 BACKGROUND TO THE SITE

2.1 This 414 hectare site was inspected between June 1989 and May 1990, in connection with proposals to develop a new residential settlement with supporting amenities.

2.2 On the published provisional 1:63,360 scale Agricultural Land Classification map sheet number 135 (MAFF, 1971) the site is shown as predominantly grade 2 with smaller areas of grade 3 to the west of Spring Hall and along the eastern boundary of the site. This essentially reconnaissance map is inappropriate for site specific appraisals of land quality, consequently the 1989 survey was undertaken to provide more detailed information on land quality on the Allington site.

2.3 At the time of survey the land was in arable use, typical crops including cereals (wheat and barley) peas, beans and oilseed rape.

3.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

Relief

3.1 The majority of the site is located on undulating to gently rolling land between altitudes of 15 m and 30 m above ordnance datum (AOD). A minimum altitude of approximately 14 m AOD occurs adjacent to the A1303, due west of Spring Hall. Towards the north east corner of the site the land rises more distinctly to a maximum altitude of 46 m AOD, close to the junction of the A1309 with the A11(T) road. Neither altitude nor relief are limiting factors to agricultural land quality.

3.2 The soils are naturally permeable and free draining and are mainly assessed as wetness class I, small areas of wetness class II soils occur on the particularly lowlying land west of Spring Hall, and within some of the slightly heavier soil variants with reduced subsoil permeability (see para 3.16).

Climate

3.3 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 587 mm (23.5 inches) which is low by national standards. Soils are likely to be at field capacity for a relatively short period of approximately 102 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.

3.4 The accumulated temperature for this area is approximately 1431 degrees Celsius. This parameter indicated the cumulative build up

of warmth available for crop growth and has an influence on the development of soil moisture deficits (SMD)*. In order to counter the effects of these deficits (in terms of drought stress in crops) it is necessary for soils to hold adequate reserves of plant available water.

Geology

- 3.5 The geology of this site is mapped on the 1:50,000 scale solid and drift edition geology map sheet number 188 (Geol. Surv 1981). This shows the majority of the site to comprise of Lower Chalk, with small areas of Middle Chalk occurring alongside the A11(T) road and towards the south and south east corner of the site. To the south of Heath Road small areas on the central south facing slopes are shown to be overlain by irregular patches of flint and chalk gravels of uncertain origin. Second terrace river gravels are mapped as occurring in the valley feature south and west of this point.
- 3.6 Field survey observations generally support this description but indicate that in most parts of the site the Lower chalk is overlain by thin spreads of chalky drift which are believed to have originated by solifluction and/or meltwater action during peri-glacial conditions (Soil Survey, 1966). This drift is variable in composition but generally comprises of chalk stones and occasional flints in a matrix of finely divided chalk mixed with sand.

Soils

- 3.7 The Soil Survey and Land Research Centre have mapped this area at a scale of 1:63,360. This map indicates that the majority of the central, southern and northeastern part of the site is comprised of soils of the Moulton complex and Newmarket series.

* 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.

Smaller areas of Swaffham Prior and Dullingham soil series are mapped as occurring in small depressions and valley features particularly in the more lowlying areas towards the south and west.

- 3.8 To the north, north west and west of the site a more complex soils pattern is shown to occur, comprising soils of the Wantage, Burwell and Block Series, together with a small area of the Wilbraham complex.
- 3.9 Field Survey Observations confirm the existence of the soils described above, but indicate they occur in a rather more complex pattern than indicated on the published soils map.
- 3.11 The 1:63,360 scale soil map has been superceded by a more recent, but very much more generalised map at 1:250,000 scale which broadly confirms the existence of the above soil types within the survey area.
- 3.12 For ALC purposes the soils occurring on site hae been divided into three main groups.
- 3.13 The first main group occurs towards the east of the site and approximately occupies land lying above the 30 m contour. Soils in this area are shallow and typically comprise of slightly stony medium loamy (medium clay loam, sandy silt loam, or occasionally sandy clay loam) textures which may overlie a thin horizon of chalky drift before passing into hard chalk at 40/45 cm. Frequently soils directly overlie hard chalk below 30/40 cm.
- 3.14 The second main group occurs over the central part of the site, approximately between altitudes of 20 m and 30 m AOD, soil in this area are generally deeper and comprise of medium loamy textures which overlie hard chalk below 45-65 cm depth. (Frequently a narrow horizon of chalky drift occurs below 45 cm which overlies hard chalk at depth). In a small area immediately west of Spring Hall the underlying chalk occurs as a soft highly weathered chalk marl

material below depths of 40 cm. Small isolated areas of shallower soils over chalk (see para 3.13) continue to occur randomly within this area.

- 3.15 Although profiles of the above type are typically stoneless or only slightly stony, moderately stony soil variants were recorded coinciding with the area of flint and chalk gravels south of Heath Road. (See para 3.5)
- 3.16 The third main soil group principally occurs on the low lying ground to the west and southwest of the site. Soils in this area are generally deeper and better bodied than those occurring elsewhere and are typically, but not exclusively found filling hollows or shallow valleys within the landscape. These soils typically comprise of clay loam, sandy clay loam, or less frequently sandy loam textures which may extend one metre or overlie hard chalk or flinty horizons below 80/90 cm. Shallower variants on the lower valley slopes south of Heath Road and on land lying south southwest and south east Spring Hall overlie hard chalk or flinty horizons below 60/80 cm. The shallower soil types described in paras 3.13-3.15 continue to occur randomly within this area.
- 3.17 To the west of Spring Hall soils of the above type contain or overlie humose or peaty horizons at depth, which are believed to represent the base of a former shallow lake bed.
- 3.18 In general soils in this group are stoneless or only slightly stony, although stonier variants occur on the lower slopes south of Heath Road and in the area of organic soils in north west corner of the site.
- 3.19 The principal limitation to land quality on the Allington site is droughtiness. The relative severity of this limitation depends on the depth, texture and stone content of the soil profile and the nature of the underlying chalk or chalky drift. Smaller areas of

land also limited by minor winter wetness and workability constraints. (See para 3.2)

4.0 AGRICULTURAL LAND CLASSIFICATION

The majority of the land surveyed has been graded

4.1 3a and 3b although smaller areas of grade 2 land occur in the central, western and southeastern areas. A breakdown of ALC grades in hectares and % terms is provided below:

ALC	Ha	%
2	53.3	12.9
3a	174.0	42.1
3b	170.5	41.2
Urban	9.3	2.2
Non Agricultural	6.7	1.6
	<hr/>	<hr/>
	413.8	100.0
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5.0 Grade 2

5.1 This principally comprises of deep, relatively stonefree water retentive soil types which are typically found infilling hollows and shallow valley features on the lowlying ground to the west of the site. These soils are often derived from accumulations of material, washed downslope from higher ground by solifluction processes. The soils are free or moderately free draining and are assessed as wetness class I or II. Typical profiles comprise of clay loam, or less frequently sandy clay loam textures which may extend to 1 metre, but often overlie chalk or chalk rubble below 80/90 cm.

5.2 Exceptions occur in two main areas: Firstly in the extreme south of the site where clay loam, or slightly stony sandy loam/ sandy silt loam textures overlie clay below 50/55 cm. Secondly to the east of the flyover at GR TL 558596 where the addition of soil material derived from the construction of the A45(T) road, has resulted in soil profiles extending to over one metre depth.

5.4 Land of the above type is limited by minor summer droughtiness and winter wetness/workability imperfections.

5.5 Although individual profiles of grade 2 occur in other parts of the site, - (most notably along the base of the shallow valley feature south of Heath Road, to west of Spring Hall) - these were generally too randomly located to permit separate delineation.

6.0 Grade 3a

6.1 This is mapped extensively on the site in two main situations.

To the south, southeast and southwest of Spring Hall 3a is mapped in areas of very slightly stony moderately deep clay loams overlying chalk. These soils comprise the shallower variants of those described in para 3.16-3.18, and are principally limited by moderate droughtiness imperfections.

6.2 Elsewhere 3a is mapped where slightly stony medium loamy soils overlie chalk, chalky rubble or chalky drift at moderate depth. These soils comprise the deeper soil variants of those described more fully in para 3.14 - 3.15. The land is limited by moderate droughtiness imperfections.

7.0 Grade 3b

7.1 This occurs over the remainder of the site where shallow medium loamy soils overlie chalk or chalky drift at relatively shallow depth. Crop rooting within the underlying chalk is generally

impaired consequently crops are unable to fully utilise the considerable reserves of water held at depth within the profile. The land is consequently limited by more severe droughtiness constraints.

7.2 To the extreme northwest of the site 3b is mapped in a small area of deep organic clayey soils (see para 3.17). Surface stone measurements within this area indicate that stone volumes are in excess of 15% topsoil volume, comprising medium and large subangular flints. Stone volumes of this order affect the use of precision drilling and harvesting equipment and contribute to increased wear and tear on farm machinery. This factor effectively restricts the land to subgrade 3b.

8.0 Urban and Non Agricultural Land

Green lanes and principal farm tracks have been mapped as non-agricultural, whilst the main A45 (T) road is included in urban.

MAFF
RESOURCE PLANNING GROUP
CAMBRIDGE RO

MARCH 1990

SOURCES OF REFERENCE

SOIL SURVEY OF ENGLAND AND WALES (1963), 1:63,360 Scale soil map, sheet no 188, Cambridge.

GEOLOGICAL SURVEY (1965), 1:63,360 scale solid and drift edition geology map, sheet no 188.

MAFF (1971) 1:63,360 Scale ALC Map sheet No 135 (Provisional).

SOIL SURVEY OF ENGLAND & WALES (1983), 1:250,000 scale soil map, sheet no 4, Eastern England: and accompanying legend

MAFF (1988) Agricultural Land Classification of England & Wales. Revised guidelines and criteria for grading the quality of agricultural land.

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

Appendix 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 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 most climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable crop.

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.

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