

AGRICULTURAL LAND CLASSIFICATION

BROHAM RESIDENTIAL DEVELOPMENT

BEDS

AGRICULTURAL LAND CLASSIFICATION

NORTHAMPTON ROAD, BROMHAM, BEDFORDSHIRE

1. BACKGROUND

- 1.1 The site, an area of 39.9 hectares, is the subject of an application for residential development west of Bromham village, Bedfordshire. MAFF surveyed the site in October 1991 to assess the agricultural land quality.
- 1.2 On the published Agricultural Land Classification Map Sheet 147 (Provisional, scale 1:63360 [MAFF 1971]) the survey area is shown as mainly grade 2 with smaller areas of grade 3 to the north and east. Since this map is of a reconnaissance nature designed primarily for strategic planning purposes. The current survey was undertaken to provide a more detailed ALC of the area.
- 1.3 A total of 42 soil inspections were made on site supplemented by observations from four soil pits. At the time of survey cropping included cereals and grass.

2. PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

- 2.1 Climate data for the site was obtained from the published agricultural climatic dataset (Met Office, 1989). This indicates that the site's annual average rainfall is 588 mm (23.1"). This also indicates that field capacity days are 107. During this period the timeliness of cultivations is important to avoid structural damage to the fine textured soils which predominate the survey area.

- 2.2 The accumulated temperature for this area is approximately 1432 Day degrees Celsius. This parameter indicates the cumulative build-up of warmth available for crop growth and in conjunction with rainfall has an influence on the development of soil moisture deficits (SMD)* and susceptibility to drought; soil moisture deficits of 116 mm and 110 mm are recorded for wheat and potatoes respectively.
- 2.3 These climatic characteristics do not constitute a limitation to the ALC grade.

Altitude and Relief

- 2.4 The majority of the land comprises a gently undulating plateau which lies between 45m and 50m AOD. Eastwards, land falls gently (slopes ranging from 3 to 7°) to 40m AOD except west of Bowels Wood where changes in slope angle are abrupt creating a terraced area (probably the site of a disused quarry). Slopes were measured using a Suunto clinometer and ranged from 9 to 10°, however, the variation in microrelief described above restricts land to grade 4. Furthermore, steep slopes in the range of 8.5 to 9° were measured adjacent to Salem Cotts. Gradient limitations within this area restrict the land to subgrade 3b (moderate quality agricultural land).

Geology

- 2.5 The published 1:250,000 scale geology Sheet 52° N - 02° W (IGS, 1983) shows the survey area to comprise Oxford Clay with a smaller deposit of Limestone derived Cornbrash to the south.

* 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.

Soils

2.6 The Soil Survey of England and Wales have mapped the survey area on two occasions. Firstly in 1969, at 1:63360 scale and secondly, in 1983, at a reconnaissance scale of 1:250,000. The two maps broadly agree and the more recent map shows the area to comprise mainly the Hanslope Association (*1) with a narrow occurrence of the Moreton Association (*2), at the lower elevations, to the south and east. During the current survey a more detailed inspection of the soils indicated the occurrence of three main soil types.

2.6.1 The majority of the survey area comprises calcareous clayey soils which become chalky at depth. Soil wetness class has been assessed as II or III.

2.6.2 At the eastern and southern margins of the site soils derived from Limestone deposits predominate. These profiles typically comprise heavy clay loam or clay topsoils over clay upper subsoils which become slightly stony with Limestone fragments at depths 60/70 cm+. Profiles are freely draining, may be calcareous throughout with Limestone rock not being encountered within 1.2 metres depth.

2.6.3 West of Bowels Wood a small area of shallow clayey soils over Limestone rock outcrop in an area where Limestone mining may have been carried out. The area comprises a mosaic of slopes (some steep) which create a terraced area to the east.

(*1) Hanslope Association: Slowly permeable calcareous clayey soils. Some slowly permeable non-calcareous clayey soils. Slight risk of water erosion.

(*2) Moreton Association: Well drained calcareous clayey and fine loamy soils over Limestone, in places shallow and brashy. Some deeper slowly permeable calcareous clayey soils.

3. AGRICULTURAL LAND CLASSIFICATION

3.1 The definitions of the Agricultural Land Classification (ALC) grades are included in Appendix 1.

3.2 The site has been mapped as mainly subgrade 3a with smaller areas of grade 2, subgrade 3b and grade 4. The table below shows the precise breakdown of the ALC grades in hectares and percentage terms.

AGRICULTURAL LAND CLASSIFICATION		
Grade	Ha	%
2	4.9	12
3a	31.5	79
3b	3.0	7.5
4	<u>0.5</u>	<u>1.5</u>
TOTAL	<u>39.9</u>	<u>100</u>

Grade 2

3.3 Land graded 2 is associated with the soils described in paragraph 2.6.2. Profile pit observations indicate that these soils have a wetness class of I and that topsoil textures are fine and typically calcareous. At depth the presence of the Limestone fragments slightly reduces the water holding capacity of these profiles. As a result of these factors minor workability and droughtiness imperfections restrict the land to grade 2 (very good quality agricultural land).

Subgrade 3a

3.4 The majority of the survey area has been mapped as subgrade 3a and is associated with the soils described in paragraph 2.6.1*.

* Occasionally brashier variants of the soils described in para 2.6.2 outcrop south of East Lodge and in the vicinity of Grid Ref SP 999507. Slightly stony topsoil and moderately stony lower subsoils impose moderate topsoil stoniness and droughtiness limitations on the agricultural flexibility of this land.

Profile pit observations indicate that subsoils are slowly permeable at depths ranging from 35 to 45 cms. Consequently wetness class is assessed as III or II. Soils are relatively heavy and typically calcareous throughout, but in some instances upper subsoil calcium carbonate content is less than 1%. The above factors, namely profile wetness and topsoil workability combine to impose a moderate limitation on the ALC grade. Consequently land is restricted to subgrade 3a (good quality agricultural land).

Subgrade 3b

3.5 Two small areas have been graded 3b.

3.5.1 Adjacent to Salem Cotts steep slopes, measuring 8.5 - 9°, preclude the land from a higher ALC grade.

3.5.2 South east of East Lodge the land is associated with the soils described in paragraph 2.6.3. Soils are stony and overlie shattered Limestone rock at shallow depths. The presence of Limestone fragments throughout the soil medium and the shallow depth to Limestone rock imposes a significant limitation on the profile available moisture for crop growth. As a result land has been graded 3b.

Grade 4

3.6 West of Bowels Wood an area of steeply terraced sloping land, which is mainly suited to grass, has been graded 4. It is likely that this land has been mined in the past, probably for Limestone. The severe microtopographic and gradient limitations preclude the land from a higher grade.

January 1992

S ESCOTT
Resource Planning Team
ADAS Cambridge

References

INSTITUTE OF GEOLOGICAL SCIENCES, 1983. East Midlands geology sheet 52°N - 02°W. Scale 1:250,000.

MAFF, 1971. Agricultural Land Classification Map 147, 1:63360 scale.

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

METEOROLOGICAL OFFICE, 1989. Climate data extracted from the published agricultural climatic dataset.

SOIL SURVEY OF ENGLAND AND WALES, 1969. Soils of the Luton and Bedford District, 1:63360 scale.

SOIL SURVEY OF ENGLAND AND WALES, 1983. Soils of Eastern England, Sheet 4. 1:250,000 scale.

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 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, 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.

AGRICULTURAL LAND CLASSIFICATION

BROHAM RESIDENTIAL DEVELOPMENT

Map 1: Agricultural Land Classification