Camb5 20/90

AGRICULTURAL LAND CLASSIFICATION

SEMI DETAILED SURVEY OF LAND AT BROCKDISH AND NEEDHAM, NORFOLK

1. BACKGROUND

1.1 The site, an area of 193.9 hectares, is the subject of a bypass route selection around the villages of Brockdish and Needham, Norfolk. The land was surveyed by MAFF in March 1900 to assess the agricultural land quality.

1.2 Three separate routes are being considered and these are shown as an overlay on the Agricultural Land Classification map. Rout A runs south of Brockdish village while Routes B and C bypass Brockdish to the north.

1.3 On the published Agricultural Land Classification map sheet number 137, (Provisional, scale 1:63,360 (MAFF 1969)) the area is shown as Grade 3.

2. PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

2.1 Climatic data for the site was obtained from the published agricultural climatic dataset (Met Office 1989). This indicates that for the site's mean altitude range of 30 m A.O.D. the annual average rainfall ranges from 580 mm (23.7") to 591 mm (24.1"). This dataset also indicates that field capacity days are 110, and moisture deficits are 118 mm for potatoes and 121 mm for wheat. These climatic characteristics do not impose any climatic limitation on the ALC grade of the site.

2.2 Altitude and Relief

2.2.1 The site rises northwards from 20 m A.O.D. on the River Waveney to floodplain to a plateau area at approximately 40 m A.O.D.

2.2.2 The majority of the land is gently rolling, however slopes of 6-7° occur in the steeper sections adjacent to A143 road east of Brockdish*.

2.2.3 Furthermore the site is dissected by numerous valley features running north south, two of these have steep gradients. Firstly, the valley at Brook Lane on the eastern edge of the site, has slopes of upto 10° adjacent to the cave on both valley sides. This gradient limits the land to subgrade 3b but this area is too small to delineate at this scale.

Secondly, the valley at Grove Road, to the north of Brockdish, has maximum slopes of 8° on the east facing slope and 11° on the west facing slope. This steepness which limits this land to subgrade 3b.

2.3 Geology and Soils

The published 1:256,330 scale drift edition geology map sheet 16, shows the site to comprise mainly boulder clay with a narrow strip of alluvium between the A143 road and the southern boundary of the site. A small area of sand and gravel deposits occur to the east of Brook Lane, Needham.

2.4 The Soil Survey of England and Wales have mapped most of the site at a scale of 1:25,000 (Sheet TM28, Soil Survey Record No 60, 1979). The entire site has been mapped twice before, firstly, at a scale of 1:100,000 on a map entitled "The Soils of Norfolk" (1973) and secondly, at a reconnaissance scale of 1:250,000 (1983). The most recent map shows the presence of 3 main soil types. The majority of the site is mapped as Beccles 1 Association (*1) with smaller areas of the Mendham Association (*2) occurring on the River Waveney floodplain and the

* Locally slopes of upto 10° occur but they cover too small an area to delineate separately.

(1*) Beccles 1 Association (1983). Slowly permeable seasonally waterlogged fine loamy over clayey soils, associated with similar clayey soils.

(2*) Mendham Association (1983). Deep peat soils associated with the clayey over sandy soils, in part very acid. High groundwater levels. Risk of flooding.

Hanslope Association (*3) in the dissecting valleys (eg at Grove Road) and the low lying ground immediately north of the A143 road.

During the current survey a more detailed inspection of the soils was carried out.

Four main soil types occur over the site.

2.4.1 The most extensively occurring soil type coincides with the upper boulder clay plateau. Profiles typically comprise heavy clay loam or sandy clay loam topsoils. These overlie clay or occasionally heavily clay loam or sandy clay loam upper subsoils which generally become chalky boulder clay at depth. All profiles have non or very slightly calcareous topsoils and/or upper subsoils and are slowly permeable in the subsoil (Wetness Class II or III).

2.4.2 On the fringe of the boulder clay plateau a calcareous variant of the above soil type outcrops. This soil typically comprises medium clay or occasionally heavy clay loam topsoils which either directly overlie chalky boulder clay or a clay subsoil which merges into chalky boulder clay at depth. Profiles are calcareous throughout and typically have a wetness class of III.

2.4.3 The third soil type comprises lighter textured soils occurring mainly on the low lying land to the north of A143 road. Profiles typically consist of deep fine loams ie, sandy clay loam or heavy clay loam topsoils over similar subsoils. Occasionally profiles contain sandy loam horizons especially at depth. The profiles are freely draining (Wetness Class I) and are stoneless or very slightly stony throughout.

(3*) Hanslope Association (1983). Slowly permeable calcareous clayey soils. Some slowly permeable non calcareous clayey soils.

2.4.4 The fourth soil type is coarse in texture and occurs in isolated patches to the north and west of Brockdish village. Profiles typically comprise sandy loam or loamy sand (occasionally sandy clay loam) topsoils, over sandy loam or loamy sand upper subsoils. Occasionally these profiles overlie clay at depth. These soils are very slightly or slightly stony and are typically freely draining (Wetness Class I).

Flooding

2.5 Personal communication with the NRA indicates that the occurrence of short term flooding on the narrow strip of land between the A143 road and Route A, east of Brockdish village is frequent enough to limit the land in this area, to subgrade 3a.

3. AGRICULTURAL LAND CLASSIFICATION

3.1 The definition of the agricultural land classification grades are included in Appendix 1.

3.2 The table below shows the breakdown of the ALC grades for the survey area.

	AGRICULTURAL LAND CLASSIFICATION	
Grade	ha	%
2	29.0	15.0
3a	89.8	46.3
3b	36.4	18.8
Urban	28.0	14.4
Non Agricultural	6.1	3.1
Agricultural Buildings	2.8	1.5
Unsurveyed	1.8	0.9
	193.9	100.0

3.3 Grade 2

Three main situations occur

3.3.1 The strip of land to the north of the A143 road east of Brockdish, is typically associated with the soils described in paragraph 2.4.3. The fine textures of the soils impose a slight limit on the water holding capacity of these profiles, which in this low rainfall area results in a slight droughtiness limitation. In the profiles which have heavy clay loam topsoils slight workability restrictions also exist. Minor droughtiness and where workability is a limitation, excludes this land from grade 1.

3.3.2 The remaining two areas of grade 2 land lie to the north and the west of Brockdish village. These areas are associated with the better drained variant of the soils described in paragraph 2.4.1**. Profiles typically have the lighter sandy clay loam topsoils and become slowly permeable at depth (45/60 cm+) ie. wetness class II. This results in both a minor wetness limitation combined with a slight droughtiness limitation restricts this land to Grade 2.

3.4 Subgrade 3a

Four main areas have been delineated.

3.4.1 The majority of the upper plateau area is associated with the less well drained variant of the soils described in paragraph 2.4.1. Profiles typically become slowly permeable from 30/35 cm. ie. Wetness Class III. The combination of sandy clay loam topsoils and impeded subsoil drainage restricts this land to subgrade 3a.

** Occasional profiles of the less droughty variant of the coarser textured soils described in paragraph 2.4.4 occur in both these grade 2 areas. Although freely draining (Wetness Class I) the presence of clay horizons at depth results in there being only a slight droughtiness limitation.

3.4.2 The second area of subgrade 3a land occurs on the fringe of the plateau area, running south from Brockdish Hall then east of Grove Road and parallel to the area of Grade 2 described in paragraph 3.3.1. This area is associated with the poorer drained variant of the calcareous boulder clay soils described in paragraph 2.4.2.

Typically, these soils are slowly permeable at shallow depths (30/35 cm) ie. Wetness Class III and although topsoils textures are heavy the poor workability limitations are slightly ameliorated by the calcareous nature of the profiles. As a result of the moderate wetness workability imperfections this land is excluded from a higher grade.

3.4.3 Land directly north of Brockdish village is a transitional area between the grade 2 and subgrade 3b. The area is associated with the more droughty variant of the soils described in paragraph 2.4.3. The coarser textures, slight subsoil stoniness (typically 5-10% flints) and the absence of clay at depth in these profiles combine to reduce the water holding capacity of this land. As a result a moderate droughtiness limitation excludes this land from a higher grade.

3.4.4 The final area of subgrade 3a land is the narrow strip between the A143 road and the southern boundary of the site east of Brockdish. This area suffers from flooding as described in paragraph 2.5. Although the permeable soils are freely draining (Wetness Class I) and they only have a slight droughtiness limitation the frequency of flooding results in the land being graded 3a.

3.5 Subgrade 3b

Four main situations occur.

3.5.1 The central circular area near Brockdish Hall, the area towards the eastern end of the site and the small piece of land on the eastern side of the valley through which Grove Road runs (north of Brockdish village) are all associated with the poorly drained variant of the soils described in paragraph 2.4.1. These soils are slowly permeable from 30/35 cm ie. Wetness Class III, they have heavy clay loam topsoils and are non calcareous throughout the entire profile. As a result wetness and workability are the chief limitations to grade.

Additionally the Grove Road valley has gradients of up to 11° occurring locally on the lower slopes (see paragraph 2.2), this also limits this land to grade 3b.

3.5.3 The small piece of land on the eastern facing slopes of the Grove Road valley is characterised by the significantly droughty variant of the coarse soils described in paragraph 2.4.4. A combination of these coarse textures, the slight topsoil stoniness (up to 10%) and the absence of clay horizons at depth results in soils having a low available water capacity. Therefore significant droughtiness is the chief limitation to the ALC grade.

3.6 Non Agricultural

3.6.1 Woodland, scrub, vacant land and recreational areas have been mapped as non agricultural.

3.7 Urban

3.7.1 Residential buildings, road and areas under construction have been mapped as urban.

3.8 Unsurveyed

3.8.1 Ownership information for the small area of unsurveyed land was unavailable.

RESOURCE PLANNING GROUP
Cambridge RO
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REFERENCES

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