AGRICULTURAL LAND CLASSIFICATION

Reconnaissance Survey
Itford – Beddingham A26(T)
Road Improvement

Ministry of
Agriculture
Fisheries
and Food

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RECONNAISSANCE SURVEY
ITFORD - BEDDINGHAM ROAD IMPROVEMENT

1. BACKGROUND

1.1 The 447.9 ha site is situated to the south east of Lewes and is bounded to the north by the main Lewes to Eastbourne railway line, to the east partially by a minor road, and partially by a small farm track; the remaining boundary has no obvious physical feature. The western boundary is formed partially by the main Newhaven to Lewes railway line and the River Ouse.

1.2 The site was surveyed during November 1990 and October 1991, using 120 cm Dutch soil augers with sampling densities of one boring per four hectares on a grid basis across the site. In addition to this, three soil pits were examined.

1.3 At the time of survey part of the area had been ploughed and was under winter cereals. These areas tend to favour a much higher elevation, although arable farming was found on the lower slopes towards the north west. The lower lying areas towards the north and adjacent to the River Ouse were under grassland pasture.

2. PHYSICAL FACTORS AFFECTING LAND QUALITY

Relief

2.1 The altitude of the site varies between approximately 1m and 60m AOD with the highest land occurring towards the east and south east of the site. Slopes with gradients between 7-15° were recorded using an optical reading clinometer, across the areas located directly east and south east of Itford Farm. Such gradients represent a significant limitation to agricultural land quality. Slopes and gradients gradually decrease as the land falls gently north, west and north west towards the flood plain of the River Ouse, at the north of the survey area.

Climate

2.2 Data interpolated from grid point data sets (Met Office 1989) indicates that the average annual rainfall for this area ranges between approximately 778-805mm (Met Office, 1989). The median accumulated temperature above 0°C between January and June, (a measure of the relative warmth of a locality), ranges from 1479-1530 day degrees depending upon altitude (Met Office, 1989). The survey area is at field capacity for approximately 165 - 170 days, which provides a measure of the effect of climate on the soil water regime. Crop adjusted moisture deficits for wheat range between 112-118mm and 105-111mm for potatoes. The survey area may be exposed to sea winds.

2.3 Climatic factors per se place no limitation on agricultural land quality at this location, but do affect interactive limitations between soil and climate, namely wetness and droughtiness.

Geology and Soils

2.4 British Geological Survey, Sheet 319, Lewes, (1978), shows the site to comprise Upper, Middle and Lower Chalk on the steeper slopes towards the south with Gault Clay and River Alluvium extending over much of the lower slopes and flood plain, to the north. Extensive Head deposits overlie these, particularly across the north-eastern part of the site, east of Beddingham.

2.5 Soil Survey of England and Wales, Sheet 6, (1983), shows the area to the south-west of Beddingham to comprise the Denchworth Association. This occurs in association with the clay deposits. The soils are described as "wet clays, which are stoneless and strongly mottled" (SSEW, 1984). The Newchurch Association is mapped on the lower slopes and the flood plain towards the north and north west. These stoneless clays are described as "being developed in marine alluvium". (SSEW, 1984). The Coombe 2 Association is mapped at the foot of the chalk scarp and across the north-eastern part of the site. These soils are described as "brown calcareous earths lacking gleyic features which merge into chalky drift at various depths", (SSEW, 1984). The Upton 1 Association is shown towards the south east of the site. These soils are described as "shallow and extremely calcareous grey rendzinas (SSEW, 1984). Soils of the Fladbury 3 Association are mapped in a small pocket towards the north of the site. These are commonly described as "grey clayey pale alluvial gley soils", (SSEW, 1984).

2.6 Field examination of the site indicates that three broad soil types occur.

2.7 The first group of soils are found principally towards the north and north west of the site but also on the valley floor across the southern part of the site, and fall into two variants.

The first variant comprises medium or heavy silty clay loam to medium clay loam topsoils, overlying medium clay or silty clay subsoils which were found to be slightly stony, ie, c.5-10% v/v flints between 30-60cm. These soils were strongly mottled and gleyed within 30cm.

The second varient occurs adjacent to the River Ouse and towards the north west. Profiles typically comprise medium or heavy silty clay loam and medium or heavy clay loam with occasional topsoils of clay or silty clay. These topsoil textures were found to overlie slowly permeable clay and silty clay at various depths. Profiles were found to be strongly mottled and gleyed between the surface and about 30 cm. Occasional profiles were found to comprise calcareous clay or silty clay in the lower subsoil.

2.8 The second group of soils were found at the foot of the chalk scarp and across the north-eastern part of the site. Profiles typically comprise calcareous, medium or heavy silty clay loam or silty clay topsoils overlying similar textures in the subsoil. An abrupt boundary occurs at 50cm or more; below this is a chalk drift comprising c.30-50% granular chalk fragments in a pale calcareous silty clay loam matrix. The chalky drift continues to depths in excess of 110cm.

2.9 The third soil type occurs in association with the steeper chalk slopes, particularly across the south-eastern part of the site. Profiles typically comprise shallow soils with calcareous medium silty clay loam topsoils overlying medium clay loam or medium silty clay loam subsoils which overlie a hard bedded chalk at about 15-50cm, which becomes impenetrable (to soil auger). Occasional profiles have topsoils resting more or less directly over chalk.

3. AGRICULTURAL LAND CLASSIFICATION

3.1 The ALC grading at this location is primarily determined by interactions between climate and soil factors namely wetness and droughtiness. However, areas limited by steep gradients were also found.

ALC grades 2, 3a, 3b and 4 have been mapped and a breakdown of these grades in terms of area and extent is given below:-

Grade	ha	% of total agricultural land
2	97.8	24%
3a	22.9	6%
3b	265.7	67%
4	12.3	3%
		100%

Total Agricultural Area	398.7
Area not surveyed	12.5
Non-Agricultural	23.8
Urban	5.3
Woodland	3.4
Agricultural Buildings	4.2
Total area of site	447.9

3.2 Appendix 1 gives a generalised description of the grades and subgrades identified in the survey. The areas that were not surveyed comprise a vented landfill and a small area of land that was set aside for road construction.

Grade 2

3.3 Land of this quality occupies 24% (97.8 ha) of the total agricultural area. Profiles typically comprise calcareous medium or heavy silty clay loam or heavy clay loam topsoil over similar textures, medium clay or silty clay. The lower subsoil comprises chalky drift to a depth of at least 120cm. These soil profiles are well drained, (wetness class I), but commonly relatively heavy topsoil textures restrict the workability of the soil. In addition to this, profiles were found to be prone to slight droughtiness, thus limiting these profiles to a maximum of grade 2.

Grade 3a

3.4 Land of this quality occupies approximately 6% (22.9 ha) of the total agricultural land of the survey area. In general these soils are similar to those graded 2, but textures are heavier or profiles slightly shallower over chalk. Consequently slight wetness and droughtiness act as limiting factors. Profiles typically comprise medium or heavy silty clay loam topsoils, over heavy silty clay loam, becoming impenetrable (to soil auger) due to chalk at various depths. Droughtiness acts to limit the potential of these soils.

Occasional profiles were found to comprise calcareous silty clay throughout. Although generally well drained some profiles were found to be gleyed within about 50cm and are thus assigned to wetness class II or III. Heavy topsoil textures combined with a relatively moist climatic regime, thus pose workability and wetness restrictions sufficient to place these soils in grade 3a.

Grade 3b

3.5 Land of this quality occupies approximately 67% (265.7 ha) of the total agricultural land of the survey area, and occurs in two situations. The majority of land graded 3b is located north west and south west of Beddingham and west of Itford Farm. Profiles typically comprise medium or heavy silty clay loam and medium or heavy clay loam topsoils over similar textures or slowly permeable clay at various depths. These profiles were found to be mottled and gleyed between the surface and about 60cm, and are assigned to wetness class III and IV. Occasionally better drained profiles which would be eligible for grade 3a occur within this unit. However such profiles do not occur extensively and are thus not delineated as a separate map unit. Occasional profiles were found to rest over slowly permeable calcareous clay and silty clay between about 18 and 55cm.

The area of land graded 3b directly east of Itford Farm typically comprises silt loams or medium silty clay loams over chalk at relatively shallow depths. Although these soils are prone to droughtiness, it is gradient which is the overriding limitation to land quality. Gradients between 7° and 11° were measured using an optical reading clinometer. Limitations due to slopes have a significant effect on the efficiency flexibility and safety of mechanised farm operations, and thereby limit this land to a maximum of grade 3b.

Overall, a combination of wetness, workability, droughtiness and gradient limits the agricultural land quality of land assigned to grade 3b.

Grade 4

3.6 Land of this quality occupies approximately 3% (12.3 ha) of the total agricultural land quality of the survey area, and occurs in two situations.

The area of land graded 4 directly east and south east of Itford Farm typically comprises calcareous silt loam topsoils becoming impenetrable (to soil auger) due to chalk between c.15 - 30cm. Although these profiles are limited by droughtiness, the overriding limitation to this land in terms of agricultural land quality is slope. Gradients were measured between 12° and 15° using an optical reading clinometer. As a result of these measurements the land was assigned to grade 4, due to the restricted mechanised farm operations that could be carried out safely and efficiently.

Grade 4 land was also found towards the centre of the site adjacent to the railway line. Profiles typically comprise peaty loam topsoils overlying medium clay subsoils which were mottled and gleyed within 10cm. Wetness class V is assigned to this land on the basis of high ground water and slow permeability. Across this low lying area, it is thought that under drainage is unlikely to be effective due to a lack of satisfactory outfalls. As a result these soils are graded 4.

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SOURCE OF REFERENCE

British Geological Survey (1978) Sheet 319 Lewes.

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