Cambs 42/90

AGRICULTURAL LAND CLASSIFICATION AND SOIL PHYSICAL CHARACTERISTICS

BITTERING WESTERN EXTENSION, EAST DEREHAM, NORFOLK

1. BACKGROUND

1.1 The site, an area of 21 hectares, is the subject of an application, by Tarmac Quarry Products, for the extraction of sand and gravel west of Bittering, Norfolk. Reading Agricultural Consultants assessed the land quality on site in April 1990. In August 1990 MAFF surveyed the land to verify the ALC gradings and to produce a soil physical characteristics report. MAFF have taken irrigation into account and consider the land to be of a better quality than that mapped by RAC. It is not clear whether RAC have considered the benefit afforded by irrigation when grading these soils.

2. SITE PHYSICAL CHARACTERISTICS

2.1 Climate

Climate data for the site was obtained from the published agricultural climatic dataset (Met Office, 1989). This indicates that for the site's mid range altitude the annual average rainfall is 702mm (27.6"). This data also indicates that the field capacity days are 146 and moisture deficits are 104mm for wheat and 96mm for potatoes. The climatic characteristics do not impose any climatic limitation on the ALC grading of the survey site.

2.2 Altitude and Relief

The survey area comprises a gently sloping plateau ranging in altitude from 60 to 64m AOD. Gradient and altitude do not constitute limitations to the ALC grade.

3. AGRICULTURAL LAND CLASSIFICATION

3.1 The definitions of the Agricultural Land Classification (ALC) grades are included in Appendix 2.

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

AGRICULTURAL LAND CLASSIFICATION

Grade	ha	%
2	13.2	63
3b	7.5	35.5
Non Agricultural	0.3	1.5
TOTAL	21.0	100

3.3 Irrigation

The survey area is regularly irrigated significantly enhancing the potential of the light soils which characterise the site. The ALC grade assigned to most of the survey area takes into account the reduction in drought risk afforded by irrigation. Where the land is graded 3b topsoil stone remains the over-riding limitation to the ALC grade.

3.4 Grade 2

The majority of the site has been graded 2. This land is associated with the coarse loamy soils mapped as soil type A. (described in paragraph 4.2.1). With irrigation water available to supplement the moisture reserves of these soils this land is slightly droughty. Consequently minor droughtiness imperfections exclude this land from a higher grade.

3.5 Subgrade 3b

The remainder of the site has been graded 3b. This land is associated with the stonier soils of soil type B which are described in full in paragraph 2.4.2. Profiles are significantly droughty and topsoil stone content ranges from 20 to 25% small, medium and large flints. These stony topsoils have the potential to do considerable damage to cultivation and harvesting machinery. Consequently the costs of production are likely to be increased and the flexibility in the use of the land reduced. Thus, despite the alleviation in drought risk afforded

by irrigation topsoil stone restricts the land to subgrade 3b.

4. SOIL PHYSICAL CHARACTERISTICS

4.1 Geology

The published 1:250;000 small scale geology map shows the site to overlie a bedrock of Upper Chalk. No detailed map of the drift deposits exists for this area. However, the small scale Soil Survey maps (1973 1:100,000 and 1983 1:250,000) for the area indicate that the soils are derived from geological deposits of chalky till and glaciofluvial drift.

4.2 Soils

During this survey two main soil types were identified.

4.2.1 Soil Type A (refer to Appendix 1 and the Soil Map)

The majority of the site comprises light textured soils which typically comprise very slightly stony medium sandy loam topsoils over very slightly or slightly stony loamy medium sand or occasionally medium sandy loam upper subsoils. Below 50/80cms depth subsoils become stonier unless sandy clay loam horizons are encountered 60/100cm^{+}. Profiles are freely draining (ie wetness class I) and slightly droughty.

4.2.2 Soil Type B (refer to Appendix 1 and the Soil Map)

The remaining land on site comprises a stonier soil variant. Topsoils typically consist of moderately stony medium sandy loams which overlie moderately stony loamy medium sand or occasionally medium sandy loam subsoils. Profiles are occasionally less stony at depth.

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APPENDIX 1

DESCRIPTION OF SOIL PHYSICAL CHARACTERISTICS

SOIL TYPE A

Topsoil	texture	: medium sandy loam
	stone	: 3 - 5% small and medium flints
	depth	: 30/35cm
Upper Subsoil	texture	: loamy medium sand or occasionally medium sandy loam
	stone	: 3 - 12% small flints
	structure	: weakly developed coarse and medium subangular blocky
	depth	: 50/80cm
Lower Subsoil	texture	: loamy medium sand*
	stone	: 6 - 25 % small flints
	structure	: weakly developed medium subangular blocky
	depth	: 120cm

* occasionally bands of sandy clay loam occur below 60/100cm+.

SOIL TYPE B

Topsoil	texture	: medium sandy loam
	stone	: 20 to 25% small, medium and large flints
	depth	: 30cm
Subsoil	texture	: loamy medium sand or occasionally medium sandy loam
	stone	: 16 to 20% small and medium flints**
	structure	: weakly developed medium subangular blocky
	depth	: 120cm

Additional Information

Rooting : Rooting is evident throughout the profiles of both soil types

Drainage Status : Profiles are freely draining ie wetness class I.

** subsoils may become less stony at depth.

APPENDIX 2

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 and 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 levels 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.

References

GEOLOGICAL SURVEY OF ENGLAND AND WALES (1985).
Solid geology map sheet 52°N - 00° Scale 1:250,000.

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

METEOROLOGICAL OFFICE (1989). Climatic Data extracted from the published Agricultural Climatic Dataset.

SOIL SURVEY OF ENGLAND AND WALES (1973). "Soil of Norfolk", Scale 1:100,000.

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