Cambs 54/90

AGRICULTURAL LAND CLASSIFICATION INCORPORATING SOIL PHYSICAL CHARACTERISTICS

LAND AT ANSON'S FARM, SWINDERBY, LINCS

1. BACKGROUND

1.1 The site, an areas of 53.8ha, is the subject of an application, by Butterley Aggregates Ltd, for the extraction of sand and gravel at Anson's Farm, Swinderby, Lincolnshire.

1.2 MAFF surveyed the site in December 1990 at an auger boring density of one per hectare. This survey was supplemented by information from subsoil inspection pits.

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 median altitude (16m AOD) the annual average rainfall is 579mm (22.8").

This data also indicates that the field capacity days are 113 and moisture deficits are 113mm for wheat and 107mm 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 fairly level plateau at an altitude of 16m 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	5.6	10.4
3a	23.0	42.8
3b	24.0	44.6
Non Agricultural	1.2	2.2
TOTAL	53.8	100

3.3 Grade 2

A small area of grade 2 land has been mapped on the eastern side of the site. This area is associated with the finer textured, less stony variant of Soil Type 1 (described in paragraph 4.2.1). These soils have slowly permeable sandy clay loam, typically wetness class III subsoils, which combine with the light topsoils textures to impose a minor wetness limitation on the land. In addition these profiles are slightly droughty in this low rainfall area. Consequently slight wetness and droughtiness limitations prevent this land from being grade 1.

3.4 Subgrade 3a

Two areas of subgrade 3a land have been mapped. The small area on the western side of the site is associated with the better bodied variant of Soil Type 2 (paragraph 4.2.2). The larger area on the eastern side of the site is associated with the stonier and lighter textured variant of Soil Type 1 (paragraph 4.2.1). In both these areas the coarse loamy textures and the presence of stony horizons impose a moderate

limitation on the potential for these soils to retain water in this low rainfall area. As a result the profiles are moderately droughty and restricted to subgrade 3a.

3.5 Subgrade 3b

The rest of the site is graded subgrade 3b and is associated with Soil Type 2 (described in paragraph 4.2.2). The sandy textures and the presence of stony horizons within these profiles significantly restricts the potential for these soils to retain water. Droughtiness is therefore the overriding limitation to the ALC grade.

4. SOIL PHYSICAL CHARACTERISTICS

4.1 Geology

The published 1:50,000 solid and drift edition geology map sheet 114 (Geological Survey of England and Wales 1968) shows the area to comprise river sands and gravels.

4.2 Soils

During the survey two main soil types were identified.

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

The eastern half of the site is mapped as Soil Type 1. Profiles typically comprise sandy loam topsoils over sandy loam or sandy clay loam (occasionally loamy sandy) upper subsoils. These overlie similar or heavier lower subsoils. Typically the heavier textured profiles, are slowly permeable (ie wetness class II or III) whilst the lighter profiles are freely draining (ie wetness class I). These soils are very slightly or slightly stony throughout.

4.2.2 Soil Type 2 (refer to Appendix 1 and the Soil Map)

These more droughty, lighter textured soils occur on the western half of the site. Profiles typically comprise very slightly to slightly stony loamy sand (occasionally sandy loam) topsoils. These overlie

very slightly to moderately stony loamy sand upper subsoils over similar or heavier lower subsoils. Profiles may become gravelly at depth (50/60cm+).

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Appendix 1

Description of the soil physical characteristics

Soil Type 1

Topsoil	Texture	:	medium sandy loam
	Stone	:	1 - 8% small and medium flints
	Depth	:	30/35cm
Upper Subsoil	Texture	:	sandy clay loam or sandy loam occasionally loamy medium sand
	Stone	:	1 - 15% flints
	Structure	:	weakly developed coarse and very coarse subangular blocky
	Consistence	:	firm or friable
	Gleying	:	yes (where sandy clay loam)
	Depth	:	45/70cm
Lower Subsoil	Texture	:	sandy clay loam or clay (occasionally sandy loam or loamy sand)
	Stone	:	5 - 15% flints
	Structure	:	weakly developed coarse and very coarse subangular blocky
	Consistence	:	firm or friable
	Gleying	:	yes (where sandy clay loam or clay)
	Depth	:	120cm

Soil Type 2

Topsoil	Texture	:	Loamy medium sand or occasionally medium sandy loam
	Stone	:	2 - 15% small and medium flints
	Depth	:	30/35cm
Upper subsoil	Texture	:	loamy medium sand
	Stone	:	ranges from 5 - 25% flints, typically 10 - 15%
	Structure	:	weakly developed medium subangular blocky
	Consistence	:	very friable
	Depth	:	45/70cm
Lower subsoil	Texture	:	medium sand or loamy medium sand
	Stone	:	5 - 25% flints
	Structure	:	weakly developed medium subangular blocky or structureless
	Consistence	:	very friable
	depth	:	120cm - may overlie gravelly material from 50/60cm

Additional Information

Rooting	:	Rooting is evident throughout the profiles of both soil types
Organic Matter	:	Topsoil organic matter content ranges from 3.60 - 5.00%
Gravelly material	:	approx 40% flints, in a loamy medium sand, or sand matrix

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 with 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 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.

References

GEOLOGICAL SURVEY OF ENGLAND AND WALES 1968

Solid and drift edition Geology sheet 114, (Lincoln) 1:50,000

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.