Cambs 55/90

AGRICULTURAL LAND CLASSIFICATION INCORPORATING SOIL PHYSICAL CHARACTERISTICS

LAND EAST OF SWINDERBY, LINCS

1. BACKGROUND

1.1 The site, an area of 36.3 hectares, is the subject of an application, by Redland Aggregates Ltd, for the extraction of sand and gravel East of Swinderby, Lincolnshire. The MAFF, December 1990, survey of land quality and soil physical characteristics incorporates data collected by the Rural Planning Services. This report and associated maps set out in detail the results of the MAFF survey.

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 580 mm (22.8"). This data also indicates that the field capacity days are 113 and moisture deficits are 114 mm for wheat and 107 mm 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 of 16 m AOD in altitude. 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	%
3a	36.3	100
TOTAL	36.3	100

3.3 Irrigation

The site is regularly irrigated, significantly enhancing the agricultural potential of the light soils which characterise the site. There is sufficient water to irrigate the whole site; however the better bodied soils of soil type 1 remain subgrade 3a because patches of stone exceeding 10% are common at the western extent of this soil type. The ALC grade assigned to the remainder of the site takes into account the reduction in drought risk afforded by irrigation.

3.4 Subgrade 3a

The whole site has been graded 3a. The soils are described in full in paragraphs 4.2.1 and 4.2.2. Two main situations occur.

3.4.1 In association with soil type 1 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 profiles are moderately droughty and restricted to subgrade 3a. Irrigation would alleviate the drought risk afforded by these soils but the presence of common patches of topsoil stone exceeding 10% precludes this land from being a higher grade.

3.4.2 The remainder of the site comprises droughty sandy soils which benefit from the irrigation water available on site. With irrigation this land is capable of supplying moderate reserves of available water to crops. Consequently moderate doughtiness is the major 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 western and eastern peripheries of the the site comprise narrow tracts of coarse loamy soils. Profiles typically comprise slightly stony medium sandy loam topsoils over loamy medium sand or occasionally medium sandy loam upper subsoils with a similar stone content. Lower subsoils are clayey and may merge into moderately stony loamy medium sands at depth. Lighter transitional profiles are common towards the boundaries with soil type 2.

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

The centre of the site comprises lighter soils of loamy medium sand or occasionally medium sandy loam topsoils over loamy medium sands which occasionally overlie sandy clay loams at depth. Topsoils are slightly stony and upper subsoils are very slightly stony. Lower subsoils are typically slightly stony or occasionally moderately stony.

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Appendix 1

DESCRIPTION OF SOIL PHYSICAL CHARACTERISTICS

SOIL TYPE 1

Topsoil	Texture	:	medium sandy loam
	Stone	:	7-12% small and medium flints
	Depth	:	30/35 cm
Upper Subsoil	Texture	:	Loamy medium sand or occasionally medium sandy loam.
	Structure	:	weakly developed coarse subangular blocky.
	Stone	:	5-10% small flints
	Consistence	:	friable
	Depth	:	45/65 cm
Lower Subsoil	Texture	:	sandy clay, which may occasionally overlie moderately stony loamy sand.
	Structure	:	Weakly developed coarse prisms
	Stone	:	1-2% small flints
	Consistence	:	firm
	Gleying	:	Yes. (where clayey)
	Depth	:	120 cm

SOIL TYPE 2

Topsoil	Texture	:	loamy medium sand or occasionally medium sandy loam.
	Stone	:	typically 7% small and medium flints occasionally up to 10%.
	Depth	:	30/35 cm
Upper Subsoil	Texture	:	loamy medium sand
	Structure	:	weakly developed medium subangular blocks
	Stone	:	approximately 5%; occasionally up to 10% small and medium flints.
	Consistence	:	very friable
	Gleying	:	No
Lower Subsoil	Texture	:	loamy medium sand; occasionally sandy clay loam 85/90cm+
	Structure	:	weakly developed medium subangular blocks
	Stone	:	typically 5-10%; occasionally up to 20% small and medium flints.
	Depth	:	120 cm

Additional Information

Rooting	:	Rooting is evident throughout the profiles of both soil types.
Drainage Status	:	Profiles of soil type 1 have a wetness class of II due to the presence of slowly permeable subsoil sandy clay at depth. Soil type 2 is freely draining (ie wetness class I).
Organic Matter	:	Topsoil organic matter content ranges from 3-3.7%.
pH	:	Profile pH ranges from 5-6.5

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 which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where 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, 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.

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 datatest.