Cambs 41/90

AGRICULTURAL LAND CLASSIFICATION AND SOIL PHYSICAL CHARACTERISTICS REPORT

LAND AT STANWAY, ESSEX

1. BACKGROUND

1.1 The site, an area of 13.7 hectares, is the subject of an application by ARC Limited, for the extraction of sand and gravel at Stanway. MAFF surveyed the site in September 1990 to assess the agricultural land quality and soil physical characteristics.

1.2 This MAFF survey broadly confirms the soil resource survey undertaken on behalf of ARC Limited.

1.3 The site was surveyed at an auger boring density of 1 per hectare and 3 soil pits were dug in order to assess the subsoil conditions.

2.0 SITE PHYSICAL CHARACTERISTICS

Climate

2.1 Climatic data for this site was obtained from the published agricultural climatic dataset. At the median altitude of 38m AOD the annual average rainfall is 568mm (22.4") which is low by national standards. This dataset also indicates that field capacity days are 102 and moisture deficits are 121mm for potatoes and 125mm for wheat. These climatic characteristics do not impose any climatic limitation on the ALC grading of the site.

Altitude and Relief

2.2 A shallow, dry valley feature runs east/west through the site. Therefore the altitude ranges from 40m AOD at the south eastern corner to a minimum of 36m 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 grades are included in Appendix 2.

3.2 The table below shows the breakdown of the ALC grades in hectares and % terms for the survey area.

AGRICULTURAL LAND CLASSIFICATION

Grade	ha	%
2	2.2	16.0
3a	7.8	56.7
3b	1.7	12.7
Non Agricultural	1.7	12.3
Unsurveyed	0.3	2.3
TOTAL	13.7	100.0

3.3 Grade 2

The central valley area of the site has been graded 2 and is associated with Soil Type 1 described in paragraph 4.4.1. These soils have a slight droughtiness imperfection due to a combination of the soil textures and the low rainfall in this area. Locally topsoil stone (>2cm) ranges from 5-10% which also excludes this land from a higher grade. These soils are well drained (ie wetness class I). Therefore topsoil stone and droughtiness are the overriding limitations to the ALC grade.

3.4 Subgrade 3a

The majority of the site has been graded 3a. This area is associated with both a stonier variant of Soil Type 1 and a less stony variant of Soil Type 2. Commonly topsoil stone content ranges from 10-15% (>2cm in size) limiting this land to subgrade 3a. In addition profile stone and the fine textures (especially in Soil Type 2) combine to reduce the available water capacity of these soils. Therefore moderate droughtiness and/or topsoil stone content are the limitations which restrict this land to subgrade 3a.

3.5 Subgrade 3b

This area is associated with the stonier variant of Soil Type 2 which is described in paragraph 4.4.2. Topsoil stone content (typically 15-20%) acts as an impediment to cultivation, harvesting and crop growth as well as increasing production costs. Consequently this land cannot be graded higher than subgrade 3b.

3.6 Non Agricultural

The soil storage bund on the eastern side of the site has been mapped as non agricultural land.

4.0 SOIL PHYSICAL CHARACTERISTICS

Geology

4.1 The published drift edition geology map 1:50,000 scale sheet 223 (1982) shows the site to comprise glacial sands and gravel overlying London Clay at depth.

4.2 The more detailed geological survey undertaken by ARC Ltd broadly confirms the above.

Soils

4.3 The Soil Survey of England and Wales have mapped the site at a reconnaissance scale of 1:250,000 (1983). This map shows the site to comprise the Wix Association (*1).

4.4 The current more detailed survey identifies two main soil types on the site.

(*1) Wix Association. Deep, permeable, coarse loamy soils affected by groundwater. Associated with well drained sandy and coarse loamy soils and some slowly permeable seasonally waterlogged fine loamy over clayey and clayey soils giving patterned ground locally.

SOIL TYPE 1. (Refer to Appendix 1 and Soil Types Map)

4.4.1 The majority of the soils on site have been mapped as Soil Type 1. These soils typically comprise very slightly to slightly stony (ie less than 15% flints) sandy silt loam or sandy clay loam topsoils. These overlie similar coarse and fine loamy subsoils which may become more stony at depth. These soils are well drained (ie wetness class I). A detailed profile description is outlined in Appendix 1.

SOIL TYPE 2. (Refer to Appendix 1 and Soil Types Map)

4.4.2 The remainder of the site comprises a stonier soil variant which overlies clay at depth. Profiles generally comprise slightly to moderately stony, coarse or fine loamy topsoils. These overlie slightly to moderately stony similar or clayey upper subsoils with clay or clay loam textures predominating at depth. Profiles are freely draining or have a slight drainage impediment at depth where slowly permeable clayey horizons are encountered. A detailed description is outlined in Appendix 1.

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APPENDIX 1

SOIL TYPE 1

Topsoil	Texture	:	sandy silt loam or sandy clay loam occasionally sandy loam
	Stone	:	typically 5-15% comprising small and medium flints
	Depth	:	30cm
Upper Subsoil	Texture	:	sandy silt loam occasionally sandy loam or sandy clay loam
	Stone	:	typically 1-10% flints
	Structure	:	moderately developed coarse and very coarse subangular blocky
	Consistence	:	friable
	Depth	:	60/80cm
Lower Subsoil	Texture	:	clay loam, sand silt loam or occasionally clay
	Stone	:	typically 1-30% flints
	Structure	:	moderately developed coarse and very coarse subangular blocky
	Consistence	:	friable
	Biopores	:	typically >0.5%
	Depth	:	120cm

SOIL TYPE 2

Topsoil	Texture	:	sandy silt loam, sandy clay loam or occasionally sandy loam
	Stone	:	2-20% flints
	Depth	:	30cm
Upper Subsoil	Texture	:	clay loam or clay occasionally sandy silt loam or sandy clay loam
	Stone	:	5-20% flints
	Structure	:	moderately developed medium and coarse subangular blocky
	Consistence	:	firm
	Depth	:	60/80cm
Lower Subsoil	Texture	:	clay or occasionally clay loam
	Stone	:	5-30% flints
	Structure	:	moderately developed coarse and very coarse subangular blockey or too stony to assess
	Consistence	:	extremely firm
	Depth	:	120cm

Additional information

All profiles were non calcareous and have rooting to 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 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 1982 Drift edition geology map No 223 Scale 1:50,000.

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

METEOROLOGICAL OFFICE 1989 Climatic Data extracted from the published agricultural climatic dataset.

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