Cambs 51/89

AGRICULTURAL LAND CLASSIFICATION INCORPORATING SOIL PHYSICAL CHARACTERISTICS
WALTON'S HALL FARM, STANFORD-LE-HOPE, ESSEX

1. BACKGROUND

1.1 The site, an area of 46.7 hectares, is the subject of an application, by Cory Sand and Ballast Company, for the extraction of sand and gravel near Stanford-Le-Hope, Essex.

1.2 The site was previously surveyed by MAFF on a semi-detailed basis, in 1987, in connection with the preparation of the Essex Minerals Subject Plan. The current detailed Agricultural Land Classification survey broadly confirms the gradings assigned to the area during the previous survey. It must be noted that subgrade 3c does not exist in the 1988 Revised ALC System, thus the area mapped as 3c in 1987 is shown as subgrade 3b on the current ALC map.

1.3 In April 1989 the site was surveyed by Reading Agricultural Consultants to determine the ALC grading of the site using the Revised ALC System (1988). MAFF's current survey (November 1989) confirms their grading for the majority of the site. The soils and ALC detail recorded by MAFF is set out in the report below.

2. SITE PHYSICAL FACTORS

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 of 10m AOD the annual average rainfall is 554mm (21.8"). This data also indicates that the field capacity days are 101 and moisture deficits are 128mm for wheat and 126mm 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 valley side lying to the west of Mucking Marshes. The land slopes gently from 10m AOD to 5m AOD adjacent to the

railway line at the eastern edge of the site. 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	28.3	61
3a	7.7	16
3b	8.0	17
Urban	1.4	3
Non Agricultural	1.3	3
TOTAL	46.7	100

3.3 Grade 2

The majority of the survey area has been graded 2. This land is associated with the freely draining* (wetness class I) deep loamy soils of soil type A described in paragraph 4.2.1. The loamy textures and the presence of gravelly material at depth, where it occurs, impose a slight limitation on the potential for these soils to retain water in this low rainfall area. As a result profiles are slightly droughty and restricted to grade 2 (very good quality agricultural land). Where soils have a wetness class of II minor wetness and workability imperfections combine with droughtiness to exclude this land from a higher grade.

* occasionally profiles are slowly permeable at depth and have a wetness class of II.

3.4 Subgrade 3a

Adjacent to Walton's Hall Road shallower and stonier loamy profiles over gravel have been graded 3a. These soils are described in full in paragraph 4.2.2. The stones within this soil have a moderate limiting effect on the profiles water holding capacity. Consequently moderate droughtiness is the major limitation to the ALC grade.

3.5 Subgrade 3b

Two main situations arise:

3.5.1 The majority of the land graded 3b is associated with the droughty stony soils of soil type C (described in paragraph 4.2.3). The presence of many stones throughout the subsoil imposes a significant limitation on the potential of this land to retain available water for crop growth. As a result this land is restricted to subgrade 3b (moderate quality agricultural land).

3.5.2 To the southeast corner of the site the remaining land graded 3b is associated with the soils of soil type D (described in paragraph 4.2.4). The soils are typically fine loamy and non calcareous with slowly permeable horizons at variable depths in the subsoil. These slowly permeable horizons maintain the ground water level to a higher level during the year on this alluvial plain. Consequently profiles are typically wetness class III and IV. This wetness and related workability limitation restricts the land to subgrade 3b.

3.6 Non Agricultural

A remnant water filled gravel pit has been mapped as Non Agricultural.

4.1 Geology

The published 1:50,000 scale geology Sheet 257 (Romford) shows the survey area to comprise mainly floodplain gravels with a small deposit of alluvium outcropping in the southeast corner of the site.

4.2 Soils

During this survey four main soil types were identified.

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

The majority of the site comprises Soil Type A. These soils typically comprise medium clay loam or sandy silt loams which overlie medium or occasionally heavy clay loams at depth. Below this, particularly adjacent to Walton's Hall Farm, profiles may overlie gravelly material (approximately 75cm^{+}).

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

Adjacent to Walton's Hall Road shallower stonier soil variants have been mapped as Soil Type B. These soils typically comprise medium clay loam topsoils over medium clay loam or sandy silt loam upper subsoils which overlie gravelly material from approximately 70cms depth. Topsoils are very slightly or slightly stony and upper subsoils are slightly or moderately stony. The gravelly material comprises 40-55% flints in a sandy silt loam or sandy loam matrix.

4.2.3 Soil Type C (refer to Appendix 1 and Soil Types Map)

In the vicinity of Turner Farm thin soils over gravel predominate, these have been mapped as Soil Type C. These soils typically comprise topsoils of sandy silt loams over gravelly subsoils which consist of 40-55% flints in a sandy silt loam or sandy loam matrix.

4.2.4 Soil Type D (refer to Appendix 1 and Soil Types Map)

The remaining soils on site are deep and occur in association with the alluvial deposits mapped in the southeast corner of the site.

These soils typically comprise medium or heavy clay loams to depth which often overlie heavy clay loam lower subsoils. Gleying is evident throughout all subsoils and organic loam and sandy silt loam horizons occur sporadically in the subsoils of some profiles.

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DESCRIPTION OF SOIL PHSYICAL CHARACTERISTICS

SOIL TYPE A

Topsoil	texture	:	medium clay loam or sandy silt loam
	depth	:	30/35cm
Upper Subsoil	texture	:	medium clay loam or sandy silt loam
	structure	:	weakly developed medium prisms
	depth	:	60/65cm
Lower Subsoil	texture	:	medium clay loam or occasionally heavy clay loam
	structure	:	moderately developed medium prisms
	gleying	:	occasionally
	depth	:	75/120cm
Gravelly Material		:	Occasionally occurs 75cm^{+}. This material comprises 40-55% flints in a sandy silt loam matrix.

SOIL TYPE B

Topsoil	texture	:	medium clay loam
	stone	:	5 - 10% flints
	depth	:	30cm
Upper Subsoil	texture	:	medium clay loam or sandy silt loam
	stone	:	6 - 20% flints
	structure	:	weakly developed coarse and medium prisms
	depth	:	70cm
Gravelly Material		:	Comprises 40-55% flints in a sandy silt loam or sandy loam matrix.

SOIL TYPE C

Topsoil	texture	:	sandy silt loam
	stone	:	6 - 10% flints
	depth	:	25cm
Gravelly Material		:	Comprises 40 - 55% flints in a sandy loam or sandy silt loam matrix.

SOIL TYPE D

Topsoil	texture	:	medium or heavy clay loam
	depth	:	25cm
Upper Subsoil	texture	:	medium clay loam, heavy clay loam or sandy silt loam
	structure	:	weakly developed coarse and very coarse subangular blocky
	gleying	:	yes
	depth	:	60cm
Lower Subsoil	texture	:	heavy clay loam
	structure	:	as above
	gleying	:	yes
	depth	:	120cm

Additional Information

Rooting : Evident throughout all profiles.

pH : Profile pH ranges from 6.5 to 7.

Drainage Status : Profiles of Soil Type B and C are freely draining (ie wetness class I). Soil Type A is typically freely draining although occasionally may have a Wetness Class of II due to the presence of a slowly permeable subsoil at depth. The wetness class of Soil Type D ranges from III to IV.

STANFORD-LE-HOPE, ESSEX

Differences in grading between MAFF 1987 and 1989 surveys

1. 1987 semi-detailed and old ALC system.

2. 1989 detailed and Revised ALC system.

3. 1989 broadly confirms distribution and extent of grades mapped in 1987.

4. Key differences are:

(a) Slightly less grade 2 and more 3a in 1989. This is because parts of the land graded 2 in 1987 fails to meet the doughtiness requirements for grade 2 in the Revised System. South Essex has low rainfall and high MD's; 128 mm for Wheat and 126 mm for Potatoes. The Revised System puts more weight on the drought risk afforded by soils occurring in this area than the previous ALC system.

1987		1989	
Grade 2	33.5	2	28.3
3a	4.0	3a	7.7
Total	37.5	Total	36

The 1.5 hectares of land difference in these totals is due to area measurement error.

(b) The remaining approximate 8 hectares has been graded 3b in 1989 and a mix of 3c and 4 in 1987.

(1) 3c no longer exists in the Revised System, thus this droughty land is 3b in the 1989 survey.

(2) The land graded 4 in 1987 is due to poor drainage; because of the low rainfall in this area soils can be no worse than subgrade 3b on drainage with the Revised System.

(c) Textures vary slightly between the two surveys. During the 1989 survey many lab PSD measurements were taken to confirm the texturing. This facility was not available for the semi-detailed survey carried out in 1987.

Sarah

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