AGRICULTURAL LAND CLASSIFICATION AND SOIL PHYSICAL CHARACTERISTICS REPORT
KEMPS FARM, SOUTH OCKENDON, ESSEX

1. BACKGROUND

1.1 The Kemps Farm site (see Agricultural Land Classification Map) is 30.1 hectares in size and was surveyed in May 1990 in connection with the proposed working of sand and gravel. At that time, agricultural land on the site was all in arable cultivation. Irrigation of water was regularly applied to responsive crops.

2. SITE PHYSICAL CHARACTERISTICS

Climate

2.1 Climate data for the site was obtained from the published Agricultural Climatic Dataset (Met Office, 1989). Based on this dataset, it is estimated that average annual rainfall on the site is 583 mm (23.0"). The mean field capacity days value for the site is 1.04 and average soil moisture deficits for wheat are 123 mm and for potatoes 120 mm. These climatic characteristics do not impose in any direct climatic limitation on the Agricultural Land Classification grading of the site, although the relatively low rainfall and high moisture deficits emphasise the importance of soil moisture reserves and irrigation in reducing the effects of droughtiness.

Altitude and relief

2.2 The site lies at a mean altitude of just under 20 m and slopes very gently from east to west. Neither altitude nor gradient constitutes any limitation to ALC grade.

3. AGRICULTURAL LAND CLASSIFICATION

3.1 Definitions of the ALC grades at Appendix 1.

3.2 The table below shows the ALC grades for the Kemps Farm site.

	AGRICULTURAL LAND CLASSIFICATION	
Grade	ha	%
2	13.2	43.9
3a	14.9	49.5
Non Agricultural	2.0	6.6
Total Area	30.1	100.0

Grade 2

3.3 Grade 2 land occurred in the northern and northwestern part of the area surveyed. A smaller area of grade 2 is also identified in the south central part of the site (see ALC Map). Topsoils on the grade 2 are predominantly medium clay loam or sandy silt loam (occasionally sandy loam) overlying subsoil of similar texture. Coarser or gravelly (moderately stony-very stony) is commonly encountered at depth.

3.4 Subsoils are generally gleyed, even when coarse textured and stony, probably reflecting the effects of groundwater. In consequence they have been assessed as predominantly Wetness Class II. Given the medium textured topsoils which predominate on the site, wetness status imposes only slight restrictions on cultivations and traffickability. The availability of irrigation water is significantly reduces the risk of droughtiness on these soils.

Sub-grade 3a

3.5 Most of the southern and eastern part of the site is graded 3a (see ALC Map). Soils over the majority of the 3a land are similar to those on the grade 2. However there is evidence of a slightly greater wetness problem in this area (predominantly Wetness Class III). Medium textured subsoils show evidence of poor structure, possibly related to fluctuating groundwater levels, which often renders them slowly permeable.

3.6 A small area of heavier soil identified in the eastern part of this site (see Soil Map) is also limited to sub-grade 3a by a wetness/workability limitation.

Non-agricultural

3.7 The non-agricultural area identified on the ALC map consists of a pond adjoining the railway line on the eastern edge of the site.

4. SOIL PHYSICAL CHARACTERISTICS

Geology and soils

4.1 The published 1:50,000 geology sheet 257 (GSGB 1976) identifies within the vicinity of the survey site recent and Pleistocene Brickearth and Taplow terrace gravels overlying London clay. There is no largescale published soil map of the area. The 1:250,000 soil map (SSEW 1984) maps the whole area as Shabbington Association (code 841b) described as predominantly deep fine loamy or fine loamy over sandy soils variably affected by groundwater.

Soil types

4.2 Owing to the exceptionally dry conditions at the time of survey (early summer 1990) and to the stony nature of some subsoils (especially in the northern and southern parts of the site) it was not possible to auger to depth at some locations. An auger depth exceeding 75 cms was exceeded in approximately 50% of soil borings carried out on the site.

4.3 Three main soil types were identified (see also Appendix 2 and the Soil Map).

4.4 Soil Type Figure 1 predominates and comprises medium textured soils with a relatively low stone content overlying very variable lower subsoils. Topsoils and upper subsoils are sometimes slightly calcareous. Wetness Class is assessed as II and III. Subsoils, particularly in the central part of Soil Type I often appear to consist of a rather variable Brickearth-type material. These soils are relatively poorly structured possibly due to the effects of fluctuating groundwater levels (see para. 3.5).

4.5 Soil Type 2. Two areas are identified, both with slightly stony topsoils, medium in texture but often somewhat lighter than on Soil

Type 1. Gravelly material (moderately stony or stonier) is usually encountered at shallow depth. The soils are generally non-calcareous and Wetness Class is assessed as II (Type 2A) and II and III (Type 2B).

4.6. Soil Type 3 consists of a small area of deep clayey soils, which are relatively stone free. Clay is calcareous and Wetness Class is assessed as II and III.

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Appendix 1

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 to 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. When 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.

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.

DESCRIPTION OF SOIL PHYSICAL CHARACTERISTICS

SOIL TYPE 1

Topsoil	texture	:	MCL (occasionally SZL or SCL)
	stoniness	:	predominantly very slightly stony
	depth (modal)	:	30-32 cms
Upper Subsoil	texture	:	CL or SCL
	structure	:	coarse/very coarse blocky to medium prismatic
	consistence	:	moderately firm
	stoniness	:	usually not more than slightly stony
	depth	:	variable 45-65 cms
Lower Subsoil	texture	:	very variable from sandy to clayey
	structure	:)	not assessed
	consistence	:)	
	stoniness	:	variable but rarely >moderately stony and often slightly stony or less
	depth	:	to 100 cms+

SOIL TYPE 2

Topsoil	texture	:	2A SZL 2B SZC/MCL
	stoniness	:	predominantly slightly stony
	depth (model)	:	2A) 30 cms 2B)
Upper Subsoil	texture	:	2A MCL or SCL 2B SZL or SL
	structure) consistence)	:	not assessed
	stoniness	:	2A moderately stony or stonier from 45-65 cms 2B ditto from 35-60 cms
Lower Subsoil			2A) Not known 2B)

SOIL TYPE 3

Topsoil	texture	:	HCL
	stoniness	:	very slightly stony
	depth (modal)	:	30-35 cms
Subsoil	texture	:	clay
	structure) consistence)	:	not assessed
	stoniness	:	very slightly stony
	depth	:	to 90 cms+

STONINESS CATEGORIES

very slightly stony (less than 5% stone by volume)
slightly stony (5-15% stone by volume)
moderately stony (15-35% stone by volume)
very stony (more than 35% stone by volume)