Cambs 18/89

AGRICULTURAL LAND CLASSIFICATION AND SOIL PHYSICAL CHARACTERISTICS
LAND AT HATFIELD (COOPERS GREEN), HERTS

1. BACKGROUND

1.1 The site, an area of 40 hectares, is the subject of an application, by Ready Mix Concrete, for the extraction of sand and gravel at Hatfield (Coopers Green). MAFF surveyed the site in the spring of 1989 to assess the agricultural land quality and soil physical characteristics.

1.2 On the published Agricultural Land Classification Map Sheet No 160 (Provisional, scale 1:63360 MAFF, 1970) the area is shown as grade 2. Part of the southern end of the site was surveyed by MAFF in 1981 this more detailed survey shows the land to comprise a mix of grades 2 and 3.

2. PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

2.1 Climate data for the site was obtained from the published agricultural climatic dataset. (Met Office, 1989). This indicates that for the site's altitude of 80 m the annual average rainfall is 669 mm (26.3"). This dataset also indicates that field capacity days are 136 and moisture deficits are 109 mm for wheat and 102 mm for potatoes. These climatic characteristics do not impose any climatic limitation on the ALC grading of the site.

Altitude and Relief

3.2 The land lies fairly level at approximately 80 m AOD. Gradient and altitude do not constitute limitations to the ALC grade.

Geology and Soils

2.3 The published 1:50,000 scale drift edition geology map sheet 239 and the Institute of Geological Sciences 1:25,000 Scale Mineral Assessment Report No 71 shows the survey area to comprise an overburden of boulder clay over glacial sand and gravel deposits.

2.4 The Soil Survey of England and Wales have mapped the soils in the area on two occasions. Firstly, in 1963, at a scale of 1:63360 and secondly in 1983 at a reconnaissance scale of 1:250,000. These maps indicate that the land mainly comprises the Hatfield Association (*1) and the Hamble 2 Association (*2) respectively. During this survey a more detailed inspection of the soils was carried out.

Two main soil types occur over the site.

2.4.1 Soil Type 1 (refer Appendix 1)

These soils occur in two blocks at the northern and southern end of the site. They typically comprise silt loams or medium silty clay loam topsoils over medium silty clay loams (or occasionally heavy silty clay loams) which merge into heavy silty clay loams at depth. At depth (80-90 cm+) these lower subsoils may be slightly stony.

2.4.2 Soil Type 2 (refer Appendix 1)

These soils occur adjacent to Coopers Green Cottages and through the central part of the site. They typically comprise medium silty clay loam or silt loam topsoils over medium silty clay loams (or occasionally heavy silty clay loams) which overlie slightly to moderately stony heavy silty clay loams at depth. These lower subsoils overlie gravelly material which generally comprises moderately to very stony heavy silty clay loams.

3. AGRICULTURAL LAND CLASSIFICATION

3.1 The definitions of the Agricultural Land Classification grades are included in Appendix 2.

(*1) Hatfield Association: Mainly medium textured soils on silty drift of brickearth type.

(*2) Hamble 2 Association: Deep stoneless well drained silty soils and similar soils affected by groundwater; over gravel locally. Usually flat land.

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

	Agricultural Land Classification	
Grade	ha	%
2	9.8	25
3a	18.1	45
Non Agricultural	12.1	30
TOTAL	40.0	100

3.3 Grade 2

To the north and south of the site two blocks of land have been graded 2. This land is associated with the two soil types described above in paragraphs 2.4.1 and 2.4.2. Soils are very slightly or slightly droughty and typically become slowly permeable in the lower subsoil 70 cm+ (ie, wetness Class II). As a result of this minor wetness limitation the land is excluded from a higher grade.

3.4 Subgrade 3a

The majority of the agricultural land on the site has been graded 3a. This land is also associated with the two soil types described in paragraphs 2.4.1 and 2.4.2 above. These soils are gleyed directly below the topsoil, however, the presence of a dense network of coarse pores in the upper horizons means that profiles are only slowly permeable at depth 40/50 cm+ (ie wetness Class III). This overriding moderate wetness limitation restricts the land to subgrade 3a.

3.5 Non Agricultural

Woodland has been mapped as Non Agricultural.

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APPENDIX 1

DESCRIPTION OF SOIL PHYSICAL CHARACTERISTICS

SOIL TYPE 1

Topsoil	texture	:	medium silty clay loam or silt loam
	depth	:	30/35 cm
Upper Subsoil	texture	:	medium silty clay loam or occasionally heavy silty clay loam.
	mottles	:	few ochreous mottles.
	structure	:	weakly developed medium and coarse prismatic; friable consistence.
	depth	:	55/60 cm.
Lower Subsoil	texture	:	heavy silty clay loam (or occasionally silty clay)
	mottles	:	common distinct ochreous, 7.5 yr 5/6.
	structure	:	moderately developed medium and coarse prisms becoming weakly developed coarse and very coarse platy 70 cm+; friable consistence.
	stone	:	ranges from 1 - 15% medium and small subangular flints.
	depth	:	120 cm.

SOIL TYPE 2

Topsoil	texture	:	medium silty clay loam or silt loam.
	depth	:	30/35 cm
Upper Subsoil	texture	:	medium silty clay loam or occasionally heavy silty clay loam
	mottles	:	few to common ochreous
	structure	:	weakly developed medium prisms; friable consistence.
	depth	:	55/60 cm

Lower Subsoil	texture	:	heavy silty clay loam
	stone	:	10-20% small and medium subangular flints
	structure	:	weakly developed coarse subangular blocky; friable consistence
	mottles	:	common distinct ochreous
	depth	:	60/65 cm+
Gravelly	Material	:	heavy silty clay loam with 20-50% very small, small and medium subangular flints.

Additional Information

Porosity	:	Profile porosity is relatively high in the upper horizons of the two soil types because of the presence of a dense network of interlinking coarse pores. The depth to which these pores extend varies across the site.
Drainage	:	Dependent on the depth to the slowly permeable horizon, the wetness class of the soils was assessed as wetness Class II or III.
Calcium Carbonate	:	Typically non or very slightly calcareous.
Field pH	:	6.5 - 7.0

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 yields 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 crop.

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 & WALES 1978 Drift edition geology map No 239, Scale 1:50,000

INSTITUTE OF GEOLOGICAL SCIENCES 1982. 'Sand and Gravel Resources of the country around Hemel Hempstead, St Albans and Watford, Hertfordshire. Sheets TL00/TL10. Mineral Assessment Report 71, HMSO London.

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MAFF, 1988 Agricultural Land Classification of 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.

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