AGRICULTURAL LAND CLASSIFICATION
LAND AT CATCHPOLE MEADOWS, HEYBRIDGE, MALDON, ESSEX

1.0 BACKGROUND

1.1 A detailed survey was carried out over 79.0 ha of land to the north west of the village of Heybridge near Maldon, Essex. The survey site comprises an area of land enclosed by the proposed Northern Relief Road; this road has been included within a planning application for a proposed housing development on the northern side of the village.

1.2 The northern and western boundary of the site comprises the proposed alignment of the new road, which will cross existing open agricultural land. The southern and eastern boundaries are formed by the built development of the village of Heybridge and the B 1022 road.

1.3 The detailed survey was undertaken by the Cambridge Statutory Resource Planning Team of ADAS for the Land Use Planning Unit of the Ministry of Agriculture, Fisheries and Food (MAFF) during January 1996. A total of 70 auger borings were made at 100 m grid intervals, to a depth of 1.2 m wherever possible. In addition 4 soil pits were dug to help assess subsoil conditions in more detail. The area of grassland to the south of Grapnells Farm however,was not surveyed due to lack of access at the time of survey.

1.4 At the time of survey the majority of the site was under arable production, comprising fields of winter cereals and cultivated land awaiting sowing in the spring. A small area at the southern part of the site, to the south of Grapnells Farm, was under permanent grass and used for horse grazing.

1.5 The published 1:63,360 scale Agricultural Land Classification (ALC) map (MAFF, 1972) shows the site to be principally Grade 2, with a small area on the north eastern edge, alongside the B 1022, to comprise Grade 3. However this

map is of a reconnaissance nature and the current survey was undertaken to provide site specific details.

2.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

2.1 Climatic criteria are considered when classifying land as these may have an overriding limitation in terms of the agricultural use of the land. The main parameters used in the assessment of the overall climatic limitation are average annual rainfall, as a measure of overall wetness, and accumulated temperature (day °C Jan-June) as a measure of the relative warmth of an area.

2.2 A detailed assessment of the prevailing climate for the site has been made by interpolation from the 5 km grid dataset produced by the Meteorological Office (Met Office, 1989). The details are given in Table 1 and these show that there is no overall climatic limitation affecting the site.

2.3 Climatic factors do however interact with soil properties to influence soil wetness and droughtiness. The climate in this area relatively dry and warm and consequently the likelihood of a droughtiness limitation may be enhanced depending on soil conditions.

Table 1: Climatic Interpolation

Grid Reference	TL 855088
Altitude (m)	8
Accumulated Temperature (day °C, Jan-June)	1472
Average Annual Rainfall (mm)	541
Moisture Deficit, Wheat (mm)	130
Moisture Deficit, Potatoes (mm)	129
Field Capacity (Days)	95
Overall Climatic Grade	1

Altitude and Relief

2.4 The site is relatively flat and lies at an altitude of approximately 8 m AOD. The land is crossed by a number of ditches, which help to control the watertable in the soils. Altitude and relief therefore do not impose any limitation on the agricultural quality of the site.

Geology and Soils

2.5 The published 1:50,000 scale geological map (Geol Survey, 1975) shows the majority of the area to be underlain by Pleistocene and Recent River Terrace deposits, (Second Terrace Gravels). A narrow band of Head Brickearth has also been mapped along the northern boundary of the site.

2.6 There is no detailed published soil map of this district. The reconnaissance soil survey map (1:250,000) for the area (Soil Survey, 1983) shows the site to comprise soils of the Hurst association*.

2.7 The detailed survey carried out shows the presence of two distinct soil types within the site area, although considerable variation in soil depth over the underlying sand and gravel strata was apparent across the site. The majority of the area comprises fine loamy soils overlying sand and gravel, whilst in the north eastern corner, to the east of Heybridge Wood, fine loamy over clayey soils overlying sand and gravel were mapped.

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* Hurst association: Coarse and fine loamy permeable soils mainly over gravel variably affected by groundwater. Formed in River Terrace Gravel.

2.8 In the north eastern corner of the site the soils typically consist of a dark greyish brown heavy clay loam topsoil with few (1-3%) small and medium subangular flints, overlying a yellowish brown, stoneless, heavy clay loam or clay subsoil with distinct ochreous mottles. The soils typically become sandier with depth, having a sandy clay or occasionally sandy clay loam texture, with distinct ochreous and grey mottles and few angular flints. The soil inspection pit revealed strong coarse subangular blocky structure in the upper subsoil, becoming weak, very coarse subangular blocky in the sandy clay horizon. The lower subsoil was therefore found to constitute a slowly permeable layer and therefore the soils have been assessed as Wetness Class II (see Appendix I for definitions).

2.9 Over the majority of the site, fine loamy soils over sand and gravel have been mapped. These soils typically have a medium clay loam, or occasionally sandy clay loam topsoil, with few/common (2-5%) small and medium subangular and subrounded flint stones, although locallised stonier areas do occur. This overlies a brown or yellowish brown medium clay loam upper subsoil with common distinct ochreous mottles and moderately developed coarse subangular blocky structure. The lower subsoil typically becomes a sandy clay loam or coarse sandy loam with many small and medium flint stones, before the impenetrable sands and gravels are encountered. The depth to the underlying impenetrable gravel varies across the site from 45 cm in the south east to over 1.2 m, although over much of the area it is encountered at 70-90 cm depth. Soil pits within this soil type indicate that the soils are not slowly permeable, and the presence of marked manganese staining in the lower subsoil indicates the presence of a fluctuating groundwater table in the underlying sands and gravels. It is considered that the drainage network on the site largely controls the watertable level and that much of the mottling in the upper subsoil reflects former conditions and is a relict feature. These soils have therefore been assessed as Wetness Class I/II.

3.0 *AGRICULTURAL LAND CLASSIFICATION*

3.1 The land has been classified using the guidelines and criteria contained in the Agricultural Land Classification of England and Wales (MAFF, 1988). The site principally comprises Subgrade 3a land, good quality agricultural land, with a smaller area of Subgrade 3b, moderate quality agricultural land. A breakdown of the grades found within the site is given in Table 2 and a description of the grades and subgrades is given in Appendix 2.

Table 2: Distribution of grades and subgrades

Grade	Area	% of site
3a	54.4	68.9
3b	13.4	17.0
Other Land	2.1	2.6
Not Surveyed	9.1	11.5
Total	79.0	100

Subgrade 3a

3.2 The majority of the site has been assessed as Subgrade 3a, with droughtiness being the principal limitation, although wetness and workability restrictions also occur in the north eastern corner of the site. Moisture balance calculations indicate that in this low rainfall area, the deeper fine loamy soils (> 70 cm depth over the underlying sand and gravel) described in paragraph 2.9, which occur over the majority of the site, will be moderately droughty for both shallow and deeper rooting crops (eg potatoes and wheat), limiting the land to Subgrade 3a.

3.3 At the north eastern corner of the site, to the east of Heybridge Wood, the land has a wetness and workability limitation due to the presence of heavy textured soils, which are described in paragraph 2.8 above. These soils have been assessed as Wetness Class II due to the presence of slowly permeable lower subsoil horizons. Under the low rainfall that is prevalent in this area, the presence of heavy clay loam topsoil textures will result in a minor workability restriction during the wetter periods of the year, limiting the land to Subgrade 3a. These soils also have a moderate droughtiness limitation for shallow rooting crops such as potatoes, which also limits the land quality to Subgrade 3a.

Subgrade 3b

3.4 Land of this subgrade has been mapped in the areas where the underlying sands and gravels have been found at moderately shallow depths (< 70 cm depth) thereby limiting the available water capacity of the soils and resulting in stress to the crop from drought during the drier periods of the year. Moisture balance calculations indicate that these soils will be very droughty for both deep and shallow rooting crops, restricting the land quality to Subgrade 3b.

January 1996

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REFERENCES

GEOLOGICAL SURVEY OF GREAT BRITAIN, 1975. Sheet 241, Solid and Drift. 1:50,000 scale

MAFF, 1972. Agricultural Land Classification Map. Provisional. 1:63,360 scale, Sheet 162

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

METEOROLOGICAL OFFICE, 1989. Climatological Data for Agricultural Land Classification. Bracknell.

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

Appendix 1

Field Assessment of Soil Wetness Class

Soil Wetness Classification

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six soil wetness classes are identified and defined in the table below.

Definition of Soil Wetness Classes

Wetness Class	Duration of Waterlogging[1]
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years[2].
II	The soil profile is wet within 70 cm depth for 31-90 days in most years **or**, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 90 days, but only wet within 40 cm depth for 30 days in most years.
III	The soil profile is wet within 70 cm depth for 91-180 days in most years **or**, if there is no slowly permeable layer present within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31-90 days in most years.
IV	The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth for more than 210 days in most years **or**, if there is no slowly permeable layer present within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.
V	The soil profile is wet within 40 cm depth for 211-335 days in most years.
VI	The soil profile is wet within 40 cm depth for more than 335 days in most years.

Soils can be allocated to a wetness class on the basis of quantitative data recorded over a period of many years or by the interpretation of soil profile characteristics, site and climatic factors. Adequate quantitative data will rarely be available for ALC surveys and therefore the interpretative method of field assessment is used to identify soil wetness class in the field. The method adopted here is common to ADAS and the SSLRC.

[1] The number of days specified is not necessarily a continuous period.
[2] 'In most years' is defined as more than 10 out of 20 years.

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 include 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 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.

Grade 4 - poor quality agricultural land

Land with severe limitations which significantly restrict the range of crops and/or levels of yields. It is mainly suited to grass with occasional arable crops (e.g. 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.