AGRICULTURAL LAND CLASSIFICATION
PROPOSED GOLF COURSE, CUFFLEY HILL, HERTFORDSHIRE

1.0 INTRODUCTION

1.1 An Agricultural Land Classification (ALC) survey was undertaken on behalf of MAFF in September 1995, over an area of 42.8 ha in connection with a planning application for a proposed golf course development.

1.2 The site is located on the western facing side of a valley which separates the settlements of Cuffley to the west and Goff's Oak to the east. The site is bounded to the east by the built development of Goff's Oak and on its southern side by an area of woodland and the B156 road. However the proposed development does not include a small part of a field fronting the road, which will become separated from the main farm. The western boundary of the site comprises the Cuffley Brook across which is the farm steading and a narrow band of farmland before the built up area of Cuffley is encountered. The northern boundary abuts open agricultural land.

1.3 A total of 39 auger borings were made using a dutch auger to a depth of 1.2 m unless prevented by impenetrable material. In addition 3 soil pits, representative of the main soil types found, were dug to assess subsoil conditions in more detail. Stone contents were measured on the more stony soils by sieving each of the horizons identified.

1.4 At the time of survey, the two northern fields were in stubble following winter wheat, whilst the remainder of the site was under grass.

1.5 On the published 1:63 360 scale provisional ALC map (MAFF, 1970), the site is all shown as grade 3. This map however, is of a reconnaissance nature and the current survey was undertaken to provide more detailed site specific information on soils and land quality.

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 show that there is no overall climatic limitation affecting this site.

Table 1. Climatic Interpolation

Grid Reference	TL 314034
Altitude (m)	85
Accumulated Temperature (Day °C, Jan-June)	1399
Average Annual Rainfall (mm)	637
Moisture Deficit, Wheat (mm)	109
Moisture Deficit, Potatoes (mm)	101
Field Capacity (Days)	127
Overall Climatic Grade	1

2.3 Climatic factors do however interact with soil properties to influence soil wetness and droughtiness.

Altitude and Relief

2.4 The site occupies the western facing side of a broad north south orientated valley. The land falls moderately steeply from a gently sloping plateau area in the east to the stream in the valley bottom. The main valley side is dissected by

small dry tributary valleys. The altitude of the site ranges from 100 m AOD on the eastern side to approximately 53 m AOD in the valley bottom. Slopes range from 2-3° at the eastern side before falling more steeply (5-9°) over the main part of the site and levelling out in the valley bottom. Gradient therefore imposes a limitation to the agricultural quality of the land over the steeper parts of the site.

Geology and Soils

2.5 The published 1:50 000 scale geology map (Geol. Surv., 1978) shows Pleistocene Boulder Clay on the plateau in the east, with some Pleistocene Pebble Gravel overlying Eocene London Clay on the upper slopes. Midslope is mapped as London Clay with an area of Reading Beds (mottled clay, sand and pebbles) in the valley bottom.

2.6 The reconnaissance soil survey map for the area (Soil Survey, 1983) shows the eastern edge of the site to comprise soils of the Beccles 3 (*1) Association with the remainder of the site mapped as the Windsor (*2) Association.

2.7 The current detailed survey carried out on the site correlates closely with the geological map and has identified three distinct soil types on the site. On the gently sloping land at the eastern side of the site, soils developed on chalky till have been mapped, which correlate with the Beccles 3 Association soils. These soils have a dark brown heavy clay loam topsoil (25-30 cm), with few flint stones, overlying a heavy clay loam or clay upper subsoil with a few small and

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(*1) Beccles 3 Association: Slowly permeable seasonally waterlogged fine loamy over clayey soils developed in chalky till.

(*2) Windsor Association: Slowly permeable seasonally waterlogged clayey soils with brown subsoils, developed on Tertiary clays. Variants include fine loamy/silty over clayey soils and profiles with only slight seasonal waterlogging.

medium flint stones. Below 50-60 cm depth the lower subsoil texture is invariably clay with common flint and chalk stones. The upper subsoil shows faint ochreous mottling (apart from the north east corner of the site where it is distinct), with the lower subsoil being strongly mottled. The subsoil structural condition is moderate in the upper subsoil and poor below. These soils have therefore been assessed as mainly wetness class II but wetness class III at the north east corner of the site.

2.8 On the crests of the interfluves between the small side valleys and also along the lower lying land at the western side of the site, stony fine loamy soils have been identified. These soils have a dark brown, medium clay loam topsoil approximately 25 cm deep with 10-15% small and medium rounded pebbles overlying a moderately stony (20-25% small and medium pebbles) medium clay loam upper subsoil. Below approximately 50 cm depth the soil becomes much stonier (40-50% small, medium and large stones), with a sandy clay loam or sandy clay texture. Ochreous mottling is evident at depth in the soils on the upper slopes which overlie London Clay. These soils have therefore been assessed as wetness class I or II.

2.9 Over the majority of the site on the moderately steeply sloping land, clayey soils developed on the London Clay have been mapped, which correlate with the Windsor Association soils. These soils have a dark brown clay topsoil, 25-30 cm deep with few small rounded stones, overlying a stoneless, strongly mottled, pale brown clay upper subsoil. Below 45-60 cm depth the lower subsoil is a brown, faintly mottled, stoneless, clay. The structural condition of the subsoil is poor having very coarse angular blocky or prismatic structures, and the soils are therefore assessed as being wetness class III.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The land has been classified using the guidelines contained in the Agricultural Land Classification of England and Wales (MAFF, 1988). A breakdown of the

individual grades found on the site is given in Table 2 and the definition of each grade is given in Appendix 1 at the end of the report.

Table 2. Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site
3a	14.5	33.9
3b	28.3	66.1
TOTAL	42.8	100.0

Subgrade 3a

3.2 Two areas of subgrade 3a have been identified and these correlate with the stony soils described in paragraph 2.8 and also the better drained soils developed on the chalky till (paragraph 2.7). In the case of the former, the soils are restricted to this subgrade as a result of droughtiness. Moisture balance calculations indicate that as a result of the moderately high stone content in the subsoil horizons the soils will be moderately droughty in this relatively low rainfall area restricting the land to this subgrade. In the case of the better drained soils developed on the chalky till, these soils will have a moderate wetness and workability limitation. The soils have been assessed as wetness class II and have a heavy clay loam topsoil texture, which under the prevailing climatic conditions restricts the land quality to subgrade 3a.

Subgrade 3b

3.3 The majority of the site has been mapped as subgrade 3b due to a moderately severe wetness and workability restriction. Land included within this subgrade comprises the clayey soils developed on the London Clay described in paragraph 2.9 above, together with the poorer draining soils developed on the chalky till at the north east corner of the site (paragraph 2.7). Both these soil types have been assessed as wetness class III and due to the heavy topsoil

textures and the prevailing climatic conditions, land of this nature is restricted to subgrade 3b on workability grounds. A further limitation restricting some of the land to this subgrade is gradient. Slopes in excess of 7° have been measured over parts of the site which are considered limiting in terms of land quality.

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REFERENCES

GEOLOGICAL SURVEY OF ENGLAND AND WALES, 1978. Drift Edition, Sheet 239, 1:50 000 scale.

MAFF 1970. Agricultural Land Classification Map No. 160. Provisional. 1:63 360 scale.

MAFF 1988. Agricultural Land Classification of England and Wales (Revised Guidelines and Criteria for Grading the Quality of Agricultural Land). Alnwick.

METEOROLOGICAL OFFICE 1989. *Published climatic data extracted from the* agroclimatic dataset compiled by the Meteorological Office.

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

SOIL SURVEY OF ENGLAND AND WALES 1984. Soils and their use in Eastern England by C A Hodge *et al.* Harpenden.

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 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.