AGRICULTURAL LAND CLASSIFICATION
LAND WEST OF PINEHAM BARN, KISLINGBURY,
NORTHAMPTONSHIRE

1.0 BACKGROUND

1.1 This 60 hectare site was inspected during early February 1995 in connection with commercial development proposals. The main body of the site is located west of Pineham Barn and extends from the M1 in the south to Camp Lane in the north. To the north of Camp Lane a proposed access road extends northwards over the River Nene floodplain to join the A45.

1.2 A significant part of the site has been previously surveyed in 1987 when it formed part of a larger planning application for a business park. The current survey was undertaken to upgrade earlier information in accordance with requirements of the MAFF Revised guidelines and criteria for grading the quality of agricultural land (MAFF, 1988) and to collect information on areas not previously surveyed. The results of this survey supersedes previous survey work undertaken within the area.

1.3 A total of 51 auger borings were made across the site using a hand held dutch auger and this information was supplemented by data from 4 soil pits. Soils were sampled at a density of approximately one per hectare on land which had not been previously surveyed, and at a density or approximately 4 per 5 hectares elsewhere.

1.4 At the time of survey the site was mainly under arable production with smaller areas of permanent grass on the River Nene floodplain and the south of Camp Lane.

2.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

2.1 Climatic data for the site was extrapolated from the data published in the 'Climatological Datasets for ALC' (Meteorological Office, 1989). This indicates that for an average site altitude of 68 m AOD, the average annual rainfall is
630 mm (24.8 inches). Accumulated temperature (ATO) is given as 1408 day °C. It also indicates that field capacity days are 137 and that moisture deficits for wheat and potatoes are 110 mm and 103 mm respectively. These overall climatic characteristics do not impose any limitations to land quality.

Altitude and Relief

2.2 The site occupies level and gently rolling land mainly between altitudes of 65 m and 75 m AOD. A maximum altitude of 75 m AOD occurs adjacent to the A45 in the north of the site while a minimum altitude of 63 m AOD occurs on the River Nene floodplain. Where sloping land occurs gradients do not exceed 2-3° and do not therefore constitute a limitation to land quality.

Geology and Soils

2.3 The geology of this area is mapped on the 1:50 000 scale solid and drift edition geology map, sheet 185 (Geol. Surv. 1980), This shows the solid geology of the site to comprise mainly of Middle Lias Silts and Clays with a smaller area of Upper Lias Mudstone and Marlstone Rock occurring on the higher ground south of the A45. The map also shows that over large parts of the site this solid geology is obscured by the more recent drift deposits described below.

2.4 The most extensive drift deposit is alluvium which occurs on the floodplain to the south of the River Nene and in a narrow ribbon along the River Nene tributary to the south of the site.

2.5 On the lower slopes flanking the River Nene floodplain to the south of Camp Lane the underlying Lias Clay is masked by spreads of glacial gravels together with a small area of glacial boulder clay drift. To the south of this area the Lias Clay is mapped as being exposed.

2.6 Field survey investigations broadly confirm this information although no boulder clay was identified on site and much of the higher ground west of Pineham Barn appeared to be underlain by superficial deposits of Ironstones and sandy Limestones.

2.7 No detailed soil map exists for this area however the very generalised 1:250 000 soil map (Soil Survey 1983) identifies four main soil associations across the site.

2.8 Within the floodplain south of the River Nene the Fladbury 1 (*1) soil association is mapped. To the north of floodplain and on lower slopes to the south of the site the Denchworth (*2) soil association is mapped. Over the remainder of the site the Wick 1 (*3) soil association is mapped extensively with the exception of a small area in the west of the site where the Hanslope (*4) soil association is shown to occur.

(*1) Fladbury 1 Association: stoneless clayey soils, in places calcareous, variably affected by groundwater.

(*2) Denchworth Association: slowly permeable seasonally waterlogged clayey soils with similar fine loamy over clayey soils.

(*3) Wick 1 Association: deep well drained coarse loamy and sandy soils, locally over gravel. Some similar soils affected by groundwater.

(*4) Hanslope Association: slowly permeable calcareous clayey soils. Some slowly permeable non calcareous clayey soils.

2.9 Field survey observations indicate that the Denchworth association is more widespread than the generalised map indicates and that soils of the Banbury association occur in the west of the site where Hanslope association is in fact mapped.

Four main soil types were identified during field survey work.

2.10 The first main soil type occurs on lowlying level floodplain land to the south of the River Nene and in a ribbon alongside the River Nene tributary on the southern boundary of the site. Soils in these areas are derived from alluvium, are mainly non calcareous and typically comprise clay topsoils over clay subsoils which are gleyed and slowly permeable at shallow depth resulting in a wetness class of IV, or rarely III.

2.11 The second main soil type occurs to the west of the site correlating with the area graded 3a on the ALC map. Soils in this area are largely derived from Ironstone. Typical profiles are non calcareous and comprise heavy clay loam or occasionally medium clay loam topsoils over heavy clay loam or clay subsoils which usually contain quantities of weathered ironstone rock. Subsoils may extend to depth but usually overlie impenetrable rock or pale olive silty clay below 60/70 cm depth. Depending on the presence of and depth to slowly permeable silty clay, wetness class is assessed as II or less frequently I.

2.12 The third main soil type occurs to the south of Camp Lane roughly coinciding with land lying below 65 m AOD. Soils in this area are derived from glacial gravels. Typical profiles are non calcareous in upper horizons and comprise very slightly to slightly stony heavy clay loam or occasionally medium clay loam topsoils over slightly to very stony heavy clay loam or clay subsoils. These subsoils often become sandy and may overlie impenetrable gravel horizons at variable depth below 60 cm. Although permeable and free draining in surface horizons these soils are affected by fluctuating groundwater levels and have consequently been assessed mainly as wetness class II.

2.13 The fourth soil type occurs over the remaining parts of the site where soils are derived from Middle and Upper Lias Clays. These profiles are usually non calcareous in upper horizons and comprise heavy clay loam topsoils over clay or occasionally heavy clay loam upper subsoils which overlie clay lower subsoils below 50 cm depth. On lower slopes towards the south of the site and on upper ground in the north of the site the soils are often gleyed and slowly permeable immediately beneath the topsoil and are assigned to wetness class IV. On the higher ground in the central part of the site the clay subsoils are frequently interbedded with bands of weathered ironstone and/or occasionally, limestone which serves to improve subsoils drainage. Depending on the quantity of weathered rock present wetness class is mainly assessed as II or III.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The site is graded 3a and 3b. A precise breakdown of ALC grades in hectares and percentage terms is provided below.

AGRICULTURAL LAND CLASSIFICATION

ALC	Ha	%
3a	26.9	45.0
3b	32.6	54.5
Urban	0.2	0.3
Non Agricultural	0.1	0.2
TOTAL Grade 3a	59.8	100.0

Grade 3a

Land graded 3a occurs in two main locations.

3.2 To the west of the site 3a is mapped on very gently slopping land overlying relatively thin deposits of weathered Ironstone rock. Soils in this area mainly comprise of well or moderately well drained clay loams and clays which are more fully described in paragraph 2.11. Depending on the presence of slowly permeable clay or impenetrable Ironstone rock at depth within the profile the

land is limited by winter wetness or summer droughtiness constraints. Although a number of the better drained and/or lighter soil profiles are or approach grade 2, these occur too sporadically to permit separate delineation.

3.3 To the north of the site 3a land is mapped on level or very gently sloping land to the south of Camp Lane. Soils in this area are mainly derived from glacial gravels and are more fully described in paragraph 2.12. This land is limited by relatively minor summer droughtiness and winter wetness imperfections. Although individual profiles of grade 2 and 3b occur within this mapping unit they are not sufficiently extensive to permit separate delineation.

Grade 3b

This is mapped elsewhere on the site in two main situations.

3.4 Firstly on the floodplain south of the River Nene and along the southern boundary of the site where soils have developed in alluvium and are heavy and are slowly permeable at shallow depth (see paragraph 2.10). This land is limited by moderately severe wetness and workability imperfections.

3.5 Elsewhere grade 3b is mapped in areas of soils derived from Lias Clay which are more full described in paragraph 2.13. The drainage status of these soils can very over relatively short distances depending on the depth to slowly permeable clay and the proportion of weathered rock in the profile. This is particularly evident on the most elevated land above 70 m AOD where a small number of profiles of grade 3a and 2 quality randomly occur within larger areas of imperfectly to poorly drained 3b profiles. Pattern, together with winter wetness and workability constraints constitute the chief limitations to use of land in these areas.

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ADAS Statutory Group
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REFERENCE

MAFF, (1988). AGRICULTURAL LAND CLASSIFICATION. Revised guidelines and criteria for grading the quality of agricultural land.

METEOROLOGICAL OFFICE (1989). Climatological datasets for Agricultural Land Classification. Met. Office : Bracknell.

GEOLOGICAL SURVEY (1980). Solid and Drift Edition Geological sheet number 185 (Northampton). 1:50 000 scale.

SOIL SURVEY (1983). BULLETIN 13. Soils and their use in Eastern England.

SOIL SURVEY (1983). Soils of Eastern England. Sheet 4. 1:250 000 scale.

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.