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AGRICULTURAL LAND CLASSIFICATION
DUXFORD AIRFIELD DEVELOPMENT, CAMBRIDGESHIRE

1.0 BACKGROUND

1.1 The site covers an area of 55.4 ha to the north of the Imperial War Museum at Duxford and is the subject of a planning application for housing, employment and a road scheme.

1.2 ADAS Statutory Resource Planning Team undertook a detailed Agricultural Land Classification (ALC) survey of the site during July and August 1995. Information was collected from auger borings, spaced at 100 m intervals, to a depth of 120 cm, wherever possible. The very dry conditions prevailing prior to and at the time of the survey resulted in many of the auger borings failing to achieve the full sample depth. Therefore, a total of twelve inspection pits were dug to assess subsoil conditions.

1.3 On the published provisional 1:63 360 scale ALC, Sheet 148 (MAFF, 1968) the whole site is mapped as grade 2.

1.4 At the time of the initial survey the land within the site supported a range of crops, predominantly wheat but including barley, sugar beet and small areas of grassland. Irrigation was available across the site but was insufficient to allow the area to be considered for an upgrade of quality. The digging of pits was delayed until the cereals had all been harvested.

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.

Table 1 Climatic Interpolation

Grid Reference	TL 456 465
Altitude (m)	32
Accumulated Temperature (day °C, Jan-June)	1437
Average Annual Rainfall (mm)	583
Moisture Deficit, Wheat (mm)	119
Moisture Deficit, Potatoes (mm)	114
Field capacity days	104
Overall Climatic Grade	1

Altitude and Relief

2.3 The site is generally level with some slight surface undulations but rises gently from 30 m to 40 m AOD in the south west of the site. Altitude and relief therefore do not impose any limitation on the agricultural quality of the site.

Geology and Soils

2.4 The published 1:63 360 scale geological map (Geol. Survey, 1952) shows the entire site to be underlain by Middle Chalk.

2.5 The reconnaissance scale soil map for the area (Soil Survey, 1983) shows the site to comprise almost entirely the Swaffham Prior Association (*1) with a small area of the Moulton Association (*2) in the south west of the site. However, the more detailed soil map of the area at a scale of 1:63 360 (Soil Survey, 1968) shows the majority of the site as the Moulton Association with the north east part of the site comprising the Swaffham Prior Association.

2.6 The present detailed survey of the site shows the presence of a single soil type within the site. This soil type consists predominantly of a very slightly stony medium sandy loam or medium sandy clay loam topsoil overlying a similar textured very slightly to slightly stony upper subsoil. This horizon in turn overlies weathered chalk and rubbly chalk drift which generally becomes harder with depth. The depth to the weathered chalk material varies across the site and very occasionally the upper subsoil horizon was found to be absent. Stones consisted predominantly of flints, which became increasingly common in the upper soil horizons to the south west of the site. Here total stone content of the topsoil at a limited number of locations was up to 15%. Most soil horizons also contained hard chalk fragments which generally increased in frequency with depth in the soil profile. The soils occurring within the site are free draining and are assessed as wetness class I.

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 within the site is given in Table 2. The definitions of the various ALC grades is given in Appendix 1.

(*1) Swaffham Prior Association: Well drained calcareous coarse and fine loamy soils over chalk rubble. Some similar shallow soils. Deep non-calcareous loamy soils in places. Striped and polygonal soil patterns locally.

(*2) Moulton Association: Well drained coarse and fine loamy soils with similar shallow calcareous coarse loamy soils over chalk or chalk rubble in places. Patterned ground of striped and polygons gives variable soil depth.

Table 2 Distribution of grades and subgrades

AGRICULTURAL LAND CLASSIFICATION

Grade	Area (ha)	%
3a	40.1	72.3
Non-agricultural	6.1	11.0
Urban	8.5	15.4
Woodland	0.7	1.3
	55.4	100

Subgrade 3a

3.2 Land within the site has been restricted to subgrade 3a due to a moderate droughtiness restriction. The depth to which roots may exploit the soil profile is limited by the depth to the hard chalk. Hence, over most of the site roots penetrate to a depth greater than 75 cm and therefore available moisture is sufficient to achieve ALC subgrade 3a. Due to the variability across the site occasional soil profiles of grade 2 and subgrade 3b occur depending on rooting depth. However, due to the scale of mapping it is not possible to delineate these areas separately.

3.3 Irrigation is available within the proposed site, however, the quantity of water available is insufficient to raise the quality of the agricultural land.

Non-agricultural

3.4 An area of parkland surrounding buildings belonging to the Imperial War Museum is mapped as non-agricultural.

Urban

3.5 The main A505 road together with various metalled tracks, hard standing and buildings are mapped as urban.

Woodland

3.6 A small area of woodland is mapped in the north west of the site.

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ADAS Cambridge

REFERENCES

Geological Survey of England and Wales, 1952. Sheet 205, Saffron Walden, Drift Edition. Scale 1:63 360.

MAFF, 1968. Agricultural Land Classification map, provisional. Sheet 148. Scale 1: 63 360.

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

Meteorological Office, 1989. Climatalogical Data for Agricultural Land Classification.

Soil Survey of England and Wales, 1968. Soil survey map, Sheet 148. Scale 1:63 360.

Soils Survey of England and Wales, 1983. Sheet 4, 'Soils of Eastern England. Scale 1:250 000.

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.