

# LAND AT SAFFRON WALDEN AGRICULTURAL LAND CLASSIFICATION REPORT

NP12737  
Land at Saffron Walden  
Agricultural Land  
Classification Report  
Final  
Nov 2023

## REPORT

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**Appendix B – DEFRA Survey Data**

# 1 INTRODUCTION

- 1.1 This report presents the results of a detailed agricultural land classification (ALC) survey of land to the south of Saffron Walden undertaken in accordance with the Ministry of Agriculture Fisheries and Food Agricultural Land Classification of England and Wales Revised guidelines and criteria for grading the quality of agricultural land 1988 in October 2023.
- 1.2 The methodology for data collection is presented in Section 2 of the report. Section 3 describes the location, topography and climatic characteristics of the Site and Section 4 contains a review of published information relevant to the ALC of the Site. Section 5 describes the soils and agricultural land quality of the Site in detail. Section 6 provides overall conclusions and references are provided in Section 7.

## 2 METHODOLOGY

2.1 The agricultural resources that have been included in the study are agricultural land quality and soil resources. The methods used to collect data on these agricultural resources are described below.

### Agricultural Land Classification

2.2 The assessment of the effects on agricultural land quality and soil resources is based on a desk top assessment of relevant published information and a detailed site survey.

### Desk Top Study

2.3 The desk top study included the following information:

- Geological Information from British Geological Survey Internet Portal at [REDACTED]
- British Geological Survey Sheet 222 (Great Dunmow), 1:50,000;
- Soil Survey of England and Wales, National Soil Map of England and Wales, Sheet 4(Eastern England), 1:250,000 (Sheet 148) 1:63,360
- Soil Survey of England and Wales, Special Survey 2, Soils of Saffron Walden District
- The Met. Office Climatological data for Agricultural Land Classification, January 1989
- DEFRA MAGIC (Multi-Agency Geographic Information for the Countryside) website at [www.magic.defra.gov.uk](http://www.magic.defra.gov.uk)

### Site Survey

2.4 A detailed site survey was undertaken on the site in October 2023. This included the examination of 10 hand auger borings taken at the locations shown on Figure 1, together with the examination of two soil pits. The auger boring and soil pit descriptions are provided in Appendix A.

### 3 LOCATION, LAND USE, TOPOGRAPHY AND CLIMATE

#### Location and Land Use

3.1 The Site comprises two fields in arable cultivation (currently stubble). The Site lies immediately to the south of Saffron Walden to the north of the B184 Thaxted Road and to the north and north east the Knight Park retail park.

#### Topography

3.2 The Site slopes gently from just over 93m a.o.d. to the south east to about 80m a.o.d in the north. There are no agricultural limitations imposed by slope.

#### Climate

3.3 The following climatic data relevant to the assessment of specific limitations within the ALC system has been obtained from the Meteorological Office’s standard 5km grid point data set for representative points in the north, centre and south of the Site.

Climatic Data for Site	Climate Data
Altitude (m)	85m
Accumulated Temperature ATO (day degrees)	1382
Average Annual Rainfall AAR (mm)	594
Climatic Grade	1
Field Capacity Duration (days)	116
Moisture Deficit for wheat (mm)	112
Moisture Deficit for potatoes (mm)	105

3.4 The data are typical of the warm but relatively dry lowland areas of Eastern England, with a short Field Capacity Duration (a measure of climatic wetness) over the winter and moderate to high Moisture Deficits which build up during the summer. In itself, climate does not impose any agricultural imitation.

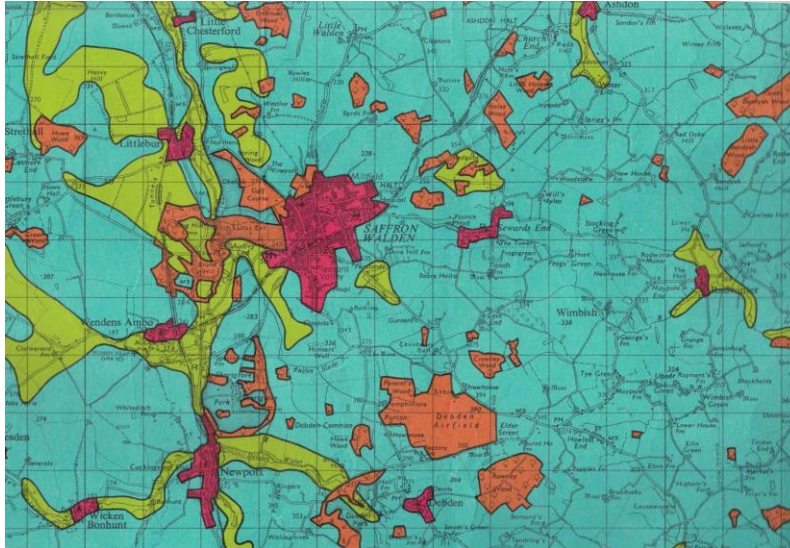
## 4 PUBLISHED GEOLOGICAL, SOIL AND ALC INFORMATION

### Geology and Soils

- 4.1 The local bedrock is chalk with potential for a small area of Head material on the south eastern fringe of the survey area.
- 4.2 The Saffron Walden area was the subject of a reconnaissance soil survey carried out by the Soil Survey of England and Wales and published at a scale of 1:63,360 in 1969 together with a descriptive report (Sheet 148 Saffron Walden). This uses the concept of Soil Associations, geographic groupings of soils usually related to specific parent materials. Within each Association there are likely to be a number of more tightly defined soil types known as Soil Series. The commonest one gives its name to the Association.
- 4.3 The soil survey sheet shows the site as Association 3 SWAFFHAM PRIOR
- 4.4 The Soil Associations on this reconnaissance map and other similar maps have been transposed more or less exactly onto the National Soil Map with due allowance for the differences in scale and updating of the numbering system used for the various Associations. Association 3 SWAFFHAM PRIOR of the Sheet 148 reconnaissance survey becomes Association 511e SWAFFHAM PRIOR on the National Soil Map
- 4.5 Association 511e SWAFFHAM PRIOR is described as a collection of "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. Slight risk of water erosion". The well drained calcareous coarse loamy soils include the Swaffham Prior series *per se* with generally sandy loam textures over chalk rubble within 80cm of the surface. Similar but deeper soils belong to the Moulton series. Conversely shallower soils with chalk or chalk rubble within 30cm of the surface would be classed as the Newmarket series.
- 4.6 The material between 30 and 50cm depth in the Newmarket series can also be described as chalk rubble with a calcareous clay loam matrix.

### Agricultural Land Classification

- 4.7 The site is on the Provisional 1:63,360 scale ALC map, Sheet 148 (Saffron Walden) published in 1969. This is the ALC map which corresponds to the reconnaissance soil survey map mentioned above and it is likely that the soil map will have been available to the compiler of the ALC map.
- 4.8 In general, areas of the SWAFFHAM PRIOR Association, including the land within this survey area are shown as Grades 3 (green) land.



- 4.9 Areas of land which comprise soils of the Swaffham Prior Association have been mapped in detail by Defra to the north of Saffron Walden close to Ickleton and Duxford and have classified the land to be a mixture of Subgrade 3a and 3b land. The Defra maps and reports for these areas are attached at Appendix B.
- 4.10 The DEFRA reports identify the soils comprising the deeper loamy soils overlying the chalk as Subgrade 3a due to a droughtiness limitation, with those where hard chalk is identified at a shallower depth within the profile and where rooting is restricted to be lower quality Subgrade 3b.



## 5 AGRICULTURAL LAND CLASSIFICATION

- 5.1 The agricultural land within the Site comprises a mixture Subgrade 3a and 3b land, limited by soil droughtiness.
- 5.2 The severity of the droughtiness limitation across the Site varies according to the thickness of the soil profile overlying rubbly and hard chalk horizons.
- 5.3 On the north eastern and north west part of the Site the profiles are slightly deeper comprising a slightly stony calcareous heavy clay loam topsoil overlying a similar upper subsoil with approximately 20-30% chalk. At a depth of approximately 55 cm, the profiles become chalky with hard chalk within approximately 75cm depth from the surface.
- 5.4 Within the remaining areas of the Site, the soil profiles are much shallower, comprising either a heavy clay loam immediately over chalk or comprising a similar topsoil overlaying chalk marl and then hard chalk within 45cm depth, where few fissures allow only limited penetration by roots.
- 5.5 The areas and percentages of Grades on the Site are therefore as follows:

ALC Grade	Area (ha)	%
3a	2.38	57
3b	1.57	37
Non Agricultural	0.24	6
<b>Total</b>	<b>4.19</b>	<b>100</b>

## 6 CONCLUSIONS

- 6.1 The Site comprises a mixture of approximately 2.4 ha of Subgrade 3a and 1.6 ha of Subgrade 3b agricultural land. The quality of land on this Site therefore comprises a significant proportion (41%) of lower quality agricultural Subgrade 3b land.
- 6.2 Indeed, the Uttlesford District Plan (2005) identifies at paragraph 5.9 that *“there is no Grade 1 land but over 80% of the District is classified Grade 2 by the Ministry of Agriculture, Fisheries and Food. There is some Grade 3a land”*. The land within this site therefore comprises some of the lowest quality agricultural land within the District and on this basis only limited weight, at most, should be attached to the loss of this area of agricultural land within that context.

## 7 REFERENCES

British Geological Survey Sheet 222 (Great Dunmow), 1:50,000. (1990)

British Geological Survey Internet Portal at [REDACTED] consulted October 2023.

Soil Survey of England and Wales, Special Survey 2, Soils of the Saffron Walden District (Sheet 148) 1:63,360 (1969)

Soil Survey of England and Wales, National Soil Map of England and Wales, Sheet 4 (Eastern England), 1:250,000 and accompanying Regional Bulletin (1984). No accompanying scan

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Agricultural Land Classification of England and Wales. Revised guidelines and criteria for grading the quality of agricultural land. October 1988.

The Met. Office Climatological data for Agricultural Land Classification. January 1989

DEFRA MAGIC (Multi-Agency Geographic Information for the Countryside) website at magic.defra.gov.uk consulted October 2023.



**FIGURES**



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- Legend**
- Site Boundary
  - Auger Boring Locations
  - ALC Grade**
  - 3a (2.38 ha)
  - 3b (1.57 ha)
  - Non-agricultural (0.24 ha)

Rev	Description	By	CB	Date

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 Project: Saffron Walden ALC  
 Title: Agricultural Land Classification Survey Plan

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Project Number: 794-ESH-PLN-00010	Scale @ A3: 1:2,000	Date Created: NOV 2023
Figure Number: 1		Rev: -

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**APPENDICES**

**Appendix A**  
**Auger Borings and Soil Pit Descriptions**

## Key to Auger Boring Descriptions

### Textures

Hcl – heavy clay loam

C – clay

### Colours

Db – dark brown

Ob – olive Brown

Yb – yellowish brown

Gb – greyish brown

Pb – pale brown

Pgb – pale greyish brown

### Others

Calc – calcareous

St – stone

IMP – Impenetrable

SPL – slowly permeable layer



## REPORT

Number	Depth	Colour	Texture	Description	Grade
1	0 – 27	Db	Hcl	5-10% stone calc	3b
	27 – 43	Yb	hcl	5 – 10% stone; approx. 30% chalk	drought
	43 +			Hard chalk	
2.	0 - 27	db	hcl	5 – 10% stone calc	3a
	27 - 50	pb	hcl	5% stone;20-30% chalk	Droughtiness
	50 – 90+			soft chalk marl	
3.	0 - 28	db	hcl	5% stone calc	3a
	28 - 55	yb	hcl	30% chalk	Droughtiness
	55 – 90+			soft chalk marl	
4.	0 - 28	db	hcl	5% stone calc 15% chalk	3b
	28 - 35			rubble chalk	Droughtiness
	35+			hard chalk	
5.	0 - 27	db	hcl	5% stone calc 15% chalk	3b
	27 - 35			rubble chalk	Droughtiness
	35+			hard chalk	
6.	0 - 28	db	hcl	5-10% stone calc	3a
	28 - 50	b	hcl/c	5-10% stone plus 15-20% chalk	Droughtiness
	50-60	pb	hcl	becoming chalky (>30%)	
	60-85			Soft rubbly chalk	
	85+			Hard chalk	
7.	0 - 28	db	hcl	5-10% stone calc	3a
	28 - 55	b	hcl	5-10% stone plus 15-20% chalk	Droughtiness
	55-60	pb	hcl	becoming chalky (>30%)	
	60-85			Soft rubbly chalk	
	85+			Hard chalk	
8.	0 - 28	db	hcl	10% stone (occn larger flints) calc	3a
	28 - 65	b	Hcl	5-10% stone 10% chalk	Droughtiness
	65 - 75	pb	hcl	Becoming chalky (30%)	
	75 – 95+			Chalky rubble	
9.	0 - 27	db	hcl	5-10% stone ; 10% chalk	3b
	27 - 38	pb	hcl	20% chalk; 5-10% stone	droughtiness
	38-45			rubbly chalk	
	45+			hard chalk	
10.	0 - 27	db	hcl	5% stone calc	3b
	27 - 35			rubble chalk	Droughtiness
	35+			hard chalk	

## Soil Pit Descriptions

### Pit 1

Close to Boring 7

- 0 – 28cm dark brown (10YR 4/3) heavy clay loam; calcareous; 5 -10% total stone; chalky frags; stubble
- 28 – 50cm brown (10YR 5/3) heavy clay loam; 5 - 10% total stone; calcareous; moderately developed coarse subangular blocky
- 50 – 60cm very pale brown (10YR 7/4) heavy clay loam mixed with 20-30% chalk and <5% stone (flint); moderately/coarse developed sub angular blocky structure.
- 60+ rubbly chalky horizon

### Pit 2

Close to Boring 4

- 0 – 28cm dark brown (10YR 4/3) heavy clay loam; calcareous; 5 % stone; 15 - 20% chalk; stubble
- 28 – 35cm fissured chalk rubble – few roots visible
- 35 cm+ hard chalk – no visible roots within the chalk

**Appendix B**  
**DEFRA Survey Data**

PROOF OF EVIDENCE  
AGRICULTURAL LAND CLASSIFICATION  
DUXFORD



Town & Country Planning Act 1990

Cambridge Sub-Regional Shopping Centre  
Public Inquiry

Proof of Evidence  
by  
Katherine A Jewson

on behalf of  
Ministry of Agriculture, Fisheries & Food

in respect of land at

DUXFORD

MAFF

Resource Planning Group  
CAMBRIDGE REGIONAL OFFICE

September 1991

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- 3.0 SUMMARY: AGRICULTURAL LAND CLASSIFICATION
- 4.0 THE MAFF AGRICULTURAL LAND CLASSIFICATION SYSTEM
- 5.0 BACKGROUND TO THE DUXFORD SITE
- 6.0 PHYSICAL FACTORS AFFECTING LAND QUALITY AT DUXFORD
  - 6.1 Altitude and Relief
  - 6.2 Climate
  - 6.4 Geology and Soils
- 7.0 AGRICULTURAL LAND CLASSIFICATION
  - 7.2 Grade 3a
  - 7.3 Grade 3b

SOURCES OF REFERENCE

ANNEX 1

AGRICULTURAL LAND CLASSIFICATION MAP

## 1.0 INTRODUCTION

My name is Katherine Ann Jewson. I am a Senior Research Officer for the Eastern Region of the Ministry of Agriculture, Fisheries and Food. I have a BA (Honours) Degree in Geography and Economics awarded by the University of Lancaster. I have been employed by the Ministry of Agriculture for eight years and have worked at the Ministry's Regional Offices in Leeds and Cambridge. Throughout this time a large proportion of my work has been concerned with the classification of agricultural land for land use planning purposes.

## 2.0 PLANNING CONSULTATION

2.1 I am attending this inquiry at the request of my colleague Mr Alasdair Sellers to provide information on agricultural land quality at the Duxford site, which I surveyed in July 1989. The results of this survey are summarised as follows:

## 3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 ALC	Ha	%
3a	23.8	35.4
3b	29.7	44.1
Non Agricultural	1.8	2.7
Urban	11.4	16.9
Unsurveyed	<u>0.6</u>	<u>0.9</u>
Total	<u>67.4</u>	<u>100.0</u>

3.2 Details of the MAFF Agricultural Land Classification system, the methodology used, and the chief limitations to agricultural land quality are provided in sections 4.0 to 7.0 of this proof.

#### 4.0 THE MAFF AGRICULTURAL LAND CLASSIFICATION SYSTEM

- 4.1 The MAFF Agricultural Land Classification (ALC) system assesses land quality based on its long term physical potential. Land is assigned to an ALC grade according to the degree to which its inherent physical characteristics impose long term limitations on agricultural use.
- 4.2 The main physical factors which are taken into account in assessing ALC grade are climate, site and soil. These may act singly, or in combination to result in varying degrees of constraint on agricultural use. The ALC grade is determined by the most limiting factor present.
- 4.3 Five main grades of land are recognised ranging from grade 1 land of excellent quality to grade 5 land of very poor quality. Other issues, such as the location of farms, the standard of fixed equipment and the accessibility of land do not affect grading although they may influence land use decisions. The definitions of the five Agricultural Land Classification grades are included in Annex 1.

#### 5.0 BACKGROUND TO THE DUXFORD SITE

- 5.1 Land on this 67 hectare site was inspected during July 1989 in connection with proposals to develop a sub-regional shopping centre and leisure development. A total of 70 soil inspections were made on site on a 100 metre grid basis and supplementary information was collected from four soil profile pits. At the time of survey the land was in arable use, typical crops including cereals, sugar beet and peas.

#### 6.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

##### Relief

- 6.1 The site straddles a wide, gently sloping open valley feature. Altitude ranges from just over 34 metres close to the M11 roundabout in the west, to a little over 25 metres where the valley bottom crosses the eastern site boundary. Neither altitude nor relief constitute limiting factors to agricultural land quality.



## Climate

- 6.2 Site specific climatic data was obtained from the 5 km grid agroclimatic dataset produced by the Meteorological Office (Met Office, 1989). This shows average annual rainfall to be approximately 582 mm (23.3 inches) which is low by national standards. Soils are likely to be at field capacity for a relatively short period of approximately 105 days.
- 6.3 The accumulated temperature for this area is approximately 1431 degrees celsius. This parameter indicates the cumulative build up of warmth available for crop growth and has an influence on the development of soil moisture deficits (SMD)\*. Soil moisture deficits of 119 mm and 115 mm are recorded for wheat and potatoes respectively. In order to counter the effects of these deficits (in terms of drought stress in crops) it is necessary for soils to hold adequate reserves of plant available water.

## Geology

- 6.4 The geology of this area is shown on the 1:63,360 scale geology map, sheet number 205 (Geol. Surv, 1952). This shows the site is comprised of Cretaceous Middle Chalk, which is overlain in a small area flanking the Moorfield Road in the east by the river valley gravels, and, in a narrow strip bordering the A505 (Royston Road) by glacial gravels. Elsewhere the Chalk is shown as being exposed.

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\* SMD represents the balance between rainfall and potential evapotranspiration occurring during the growing season. For ALC purposes the soil moisture deficits developing under a winter wheat and maincrop potato cover are considered. These 'reference' crops have been selected because they are widely grown and in terms of their susceptibility to drought, are representative of a wide range of crops.

## Soils

- 6.5 Published soil map indicate that the site is mainly comprised of soils of the Swaffham Prior soil association, with smaller areas of mainly Milton and Moulton soil associations occurring along the eastern and northern boundaries (SSEW 1968 & SSEW 1984). Detailed field survey observations broadly confirm this description but indicate that the two minor soil associations are rather smaller in extent than indicated on the published maps.
- 6.6 In very general terms soils occurring on site are free draining (wetness class I) and comprise medium loamy (sandy clay loam, medium clay loam, sandy loam and sandy silt loam) textures overlying poorly structured rubbly chalky drift\*\*, which in turn overlies hard chalk at depth.
- 6.7 Occasionally, on the valley sides, sandy clay loam textures directly overlie chalk at variable depths. Soil pit observations on site indicate that in most locations the chalk and rubbly chalky drift substrates are fairly hard, have relatively few fissures and shows only limited penetration by plant roots. (In many instances a dense root mat was observed at the surface of the underlying chalk, indicative of a root penetration problem.) In general terms soils were only very slightly stony at the surface (comprising mainly medium and small rounded chalk pebbles and subangular flints) - often becoming slightly or occasionally moderately stony at depth.
- 6.8 Some soil disturbance was evident in the vicinity of the reservoir. This is believed to be associated with the removal of runway lights previously required for the Duxford airfield.

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\*\* Rubbly chalky drift: chalk stones in a matrix of finely divided chalk mixed with sand, having a dense laminar/platy structure.

## 7.0 AGRICULTURAL LAND CLASSIFICATION

7.1 This site is covered by a current irrigation license, which at present is unused. If utilised this modest irrigation facility would make feasible the production of a small area of more demanding crops (eg potatoes) or very slightly enhanced yields of crops currently produced without the benefit of irrigation (eg. sugar beet and peas). However the abstraction levels permitted under this license are inadequate to permit any overall upgrading of land quality across the site. Therefore ALC grading presented on the accompanying map refers to the long term agricultural potential of the site in an unirrigated state.

### Grade 3a

7.2 This is mapped extensively on gently sloping land on the mid valley sides. Profiles are typically stoneless or very slightly stony and comprise moderately deep profiles of sandy loam sandy clay loam and clay loam textures typically overlying chalk or poorly structured rubbly chalky drift below 60 cm. The land is limited by droughtiness imperfections which often derive from the inability of crop roots to deeply penetrate the underlying chalk, or rubbly chalky drift, and fully exploit the reserves of plant available water it holds.

### Grade 3b

7.3 This occurs extensively on site where shallower, variably stony medium loamy soils overlies rubbly chalky drift between 35-60 cm, which subsequently overlies chalk at depth. This land is limited by slightly more severe droughtiness constraints arising from the reduced depth of medium loamy soil material over poorly structured rubbly chalky drift or chalk.

September 1991

KATHERINE A JEWSON  
Resource Planning Group  
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SOURCES OF REFERENCE

GEOLOGICAL SURVEY 1952). 1:63,360 scale drift edition geological sheet number 205.

MAFF (1988). Revised guideline and criteria for grading the quality of agricultural land.

METEOROLOGICAL OFFICE (1989). Climatological data for Agricultural Land Classification.

SOIL SURVEY OF ENGLAND & WALES (1968). 1:63,360 scale soil map sheet number 148.

SOIL SURVEY OF ENGLAND & WALES (1984). 1:250,000 scale soil map of Eastern England (Sheet 4), and accompanying Bulletin 13.

## ANNEX 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 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 will affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. When 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, 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 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.



# Agricultural Land Classification Duxford, Cambs

The ALC information on this map relates to the long term potential of the land in an unirrigated state

## AGRICULTURAL LAND

Agricultural Grades      Agricultural Land Quality

Grade 1		Very high ↑ ↓ Very low
Grade 2		
Grade 3	a b	
Grade 4		
Grade 5		

Disturbed		Agricultural Buildings	
		Unsurveyed	

## NON AGRICULTURAL LAND

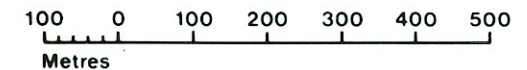
Land predominantly in urban use	
Other land primarily in non-agricultural use	

\* Land in this category does not occur on this map

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# Agricultural Land Classification Duxford, Cambs

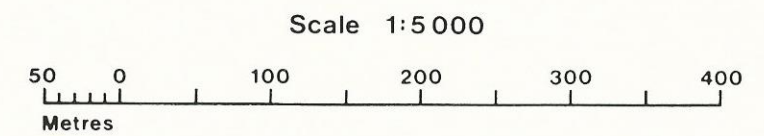
ASP 85-88 Additional work for  
47/91

• Location of auger boring



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## **AGRICULTURAL LAND CLASSIFICATION LAND AT ICKLETON, CAMBRIDGESHIRE**

### **1.0 BACKGROUND**

- 1.1 An area of approximately 29 ha near to the village of Ickleton, Cambridgeshire alongside the M11 Motorway is the subject of a planning proposal for a Motorway Service area. The site is in two sections, one either side of the Motorway.
- 1.2 The provisional Agricultural Land Classification (ALC) map of the area (MAFF 1968) shows the site to be predominantly grade 2 quality with a small area along the western edge of the site mapped as grade 3. This map is of a reconnaissance nature only and the current survey was undertaken to provide land quality information specific to the site.
- 1.3 A detailed ALC survey of the site was undertaken by ADAS Statutory Resource Planning Team during September 1995. Information was collected from auger borings, spaced at 100 m intervals, to a depth of 120 cm wherever possible. Subsoil conditions were assessed from soil inspection pits.
- 1.4 *At the time for the survey the western half of the site had the northernmost field recently planted to oilseed rape with the southern field covered with cereal stubble. The eastern half of the site had sugar beet in the northern and southern fields and the central field had recently been cultivated following cereals.*
- 1.5 An irrigation water supply is available within the site but it is of insufficient quantity to raise the overall land quality.

## 2.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

### Climate

- 2.1 Climatic criteria are considered when classifying land as they 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. Climatic factors however do interact with soil properties to influence soil wetness and droughtiness.

**Table 1. Climatic Interpolation**

	Western Section	Eastern Section
Grid Reference	TL 478443	TL 484441
Altitude (m)	55	45
Accumulated Temperature (day °C Jan-June)	1412	1423
Average Annual Rainfall (mm)	588	586
Moisture Deficit, Wheat (mm)	116	117
Moisture Deficit, Potatoes (mm)	110	111
Field Capacity Days	108	108
Overall Climatic Grade	1	1

### Altitude and Relief

- 2.3 The western section of the site rises from approximately 45 m AOD close to the motorway to a maximum altitude of approximately 60 m AOD to the west. The land also falls towards the north with moderate slopes of up to 7° in the north west.

- 2.4 The eastern section is more gently sloping with a maximum height of approximately 53 m AOD close to the centre of the section alongside the motorway. The land falls from this high point to approximately 43 m AOD. Slopes are generally gentle with a maximum of 3°.
- 2.5 Slope and relief do not therefore impose any limitation on the agricultural quality of either section of the site.

### Geology and Soils

- 2.6 The published 1:63 360 scale drift edition geology map, sheet 205 (Geol, Survey, 1952) shows the whole site as Middle Chalk.
- 2.7 No detailed soil map exists for the area but the reconnaissance 1:250 000 scale soil survey map (Soil Survey, 1983) shows the whole site to be mapped as the Swaffham Prior Association (\*). The present detailed field survey also identified a single soil type across the site.
- 2.8 The soil type found across the whole site generally consisted of a very calcareous medium clay loam or occasionally medium sandy clay loam textured topsoil overlying a similar textured upper subsoil. These horizons were very slightly to slightly stony with stones consisting of small to medium sized flints and small chalk fragments. A lower subsoil of medium clay loam textured material with weathered chalk/chalk rubble was generally overlying further weathered chalk material or hard chalk. Occasionally the topsoil directly overlay the clay loam - weathered chalk or chalky rubble horizon. The soil profiles examined were all free draining and were assessed as wetness class I.

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(\*) 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.

### 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 shown in Table 2. The definition of the ALC grades is given in Appendix 1.

**Table 2. Distribution of grades and subgrades**

Grade	Area (ha)	% of site
3a	27.2	92.8
3b	2.1	7.2
TOTAL	<u>29.3</u>	<u>100.0</u>

#### Subgrade 3a

3.2 Subgrade 3a quality land is associated with the relatively deep soil profiles above hard chalk described in paragraph 2.8. These profiles have a moderate droughtiness limitation which restricts the quality of the land to subgrade 3a. The irrigation available within the site is insufficient to raise the quality of this land.

#### Subgrade 3b

3.3 Subgrade 3b land is associated with the shallow profiles above hard chalk as described in paragraph 2.8 in a small area in the north of the eastern section of the site. The shallow depth of the soil profile above the hard chalk restricts the total available water for plant growth sufficiently to limit the quality of such profiles to subgrade 3b due to drought. The irrigation available within the site is insufficient to raise the quality of this land.

## REFERENCES

BRITISH GEOLOGICAL SURVEY, 1952. Sheet 205, Saffron Waldon, 1:63 360 scale.

MAFF, 1968. Agricultural Land Classification Map. Provisional. Scale 1:63 360, Sheet 148.

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.

SOIL SURVEY OF ENGLAND AND WALES, 1983. Sheet 4, "Soils of Eastern England". 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.



## Agricultural Land Classification

Twin Motorway Services, M11  
near Ickleton  
Cambridgeshire

### Agricultural Land

Grade	Quality	Area (ha)
1	Excellent	-
2	Very Good	-
3a	Good	27.2
3b	Moderate	2.1
4	Poor	-
5	Very Poor	-

### Other Land Categories

Category	Area (ha)
Urban	-
Non-Agricultural	-
Woodland	-
Agricultural Buildings	-
Open Water	-
Not Surveyed	-

Total agricultural land area 29.3  
Total survey area 29.3

\* Grade/category not present within survey area

Metres Scale 1:10 000

100 0 100 200 300 400 500

Further details contained in MAFF(1988) Agricultural Land Classification of England and Wales - Revised guidelines and criteria for grading the quality of agricultural land. MAFF (Publications), London SE99 7TP.

The information is accurate at the base map scale but any enlargement would be misleading.

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