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# Showell Farm Crematorium, Chippenham, Wiltshire

## Agricultural Land Classification

*Prepared for MAFF by*
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Land Use Planning Unit

MAFF

# SHOWELL FARM CREMATORIUM, CHIPPENHAM, WILTS

## AGRICULTURAL LAND CLASSIFICATION

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## SHOWELL FARM CREMATORIUM, CHIPPENHAM, WILTS

## AGRICULTURAL LAND CLASSIFICATION SURVEY

### SUMMARY

The survey was carried out by ADAS on behalf of MAFF as part of its statutory role in response to an ad-hoc application for a crematorium. The fieldwork at Showells Farm near Chippenham was completed in January 1995 at a scale of 1:10,000. Data on climate, soils, geology and previous ALC Surveys was used and is presented in the report. The distribution of grades is detailed below and illustrated on the accompanying ALC map. Information is correct at this scale but could be misleading if enlarged.

**Distribution of ALC grades: Showell Farm**

| Grade | Area (ha) | % of Survey Area | % of Agricultural Land | |
|---|---|---|---|---|
| 1 | 4.3 | 28.5 | 28.5 | |
| 2 | 7.5 | 49.7 | 49.7 | |
| 3b | 3.3 | 21.8 | 21.8 | |
| TOTAL | 15.1 | 100% | 100% | (15.1 ha) |

Most of the site is best and most versatile land of Grades 1 and 2. These deep clay loam soils and generally well drained with variable amounts of stone. A small area of clayey, poorly drained soils is Subgrade 3b.

## 1. INTRODUCTION

An Agricultural Land Classification (ALC) Survey was carried out in January 1995 at Showell Farm, Chippenham on behalf of MAFF as part of its statutory role in response to an ad-hoc application to develop a crematorium. The fieldwork covering 15.1 ha of land was conducted by ADAS at a scale of 1:10,000 (approximately one boring per hectare of agricultural land). A total of 16 auger borings were examined and 1 soil profile pit used to assess subsoil conditions. Pit information from a site on adjacent land was also used.

The published provisional one inch to the mile ALC map of this area (MAFF 1970) shows the grades of the site at a reconnaissance scale. The western part of the site is shown as Grade 1 and the eastern as Grade 2.

The area immediately north of the present site, around the nurseries was surveyed in 1993 at a scale of 1:10,000. This information was referred to during the present survey.

The recent survey supersedes the reconnaissance map having been carried out at a more detailed level and using the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF 1988). These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. The grading takes account of the top 120 cm of the soil profile. A description of the grades used in the ALC system can be found in Appendix 2.

## 2. CLIMATE

The grade of the land is determined by the most limiting factor present. The overall climate is considered first because it can have an overriding influence on restricting land to a lower grade despite other favourable conditions.

Estimates of climatic variables were interpolated from the published agricultural climate dataset (Meteorological Office 1989). The parameters used for assessing overall climate are accumulated temperature (a measure of the relative warmth of a locality) and average annual rainfall (a measure of overall wetness). The results shown in Table 1 indicate there is no overall climatic limitation.

**Table 1: Climatic Interpolations: Showell Farm**

| | | |
|---|---|---|
| Grid Reference | | ST 912 709 |
| Altitude (m) | | 47 |
| Accumulated Temperature (day °) | | 1489 |
| Average Annual Rainfall (mm) | | 739 |
| Overall Climatic Grade | | 1 |
| Field Capacity Days | | 168 |
| Moisture deficit (mm): | Wheat | 104 |
| | Potatoes | 97 |

Climatic data on Field Capacity Days (FCD) and Moisture Deficits for wheat and potatoes are also shown. These data are used in assessing the soil wetness and droughtiness limitations referred to in later sections.

## 3. RELIEF AND LANDCOVER

The site in a flat area of grassland of between 45 m AOD and 50 m AOD.

## 4. GEOLOGY AND SOILS

The geology of the site is shown on the published 1:50,000 scale solid and drift geology map, sheet 265, British Geological Survey (1990). This map shows the central and southern parts of the site to be underlain by Kellaway Clays, and the eastern corner to be first terrace gravels and the north western corner to be Cornbrash, a rubbly limestone from the Middle Jurassic period.

The soils were mapped by the Soil Survey of England and Wales in 1983 at a reconnaissance scale of 1:250,000. This map shows most of the site to comprise the Wickham 3 Association. These soils are described as slowly permeable seasonally waterlogged fine loamy over clayey and coarse loamy over clayey soils and similar more permeable soils with slight waterlogging. The eastern corner of the site is mapped as Badsey 1 Association. These soils are described as well drained calcareous fine loamy soils over limestone gravel.

During the recent survey soils similar to the mapped associations were found. Deep medium clay loam profiles were found over much of the site with the occasionally stony subsoils on the northern edge. Occasional deep slowly permeable clay soils were also found.

## 5. AGRICULTURAL LAND CLASSIFICATION

The distribution of ALC grades is shown in Table 2 and on the accompanying ALC map. The information could be misleading if shown at a larger scale.

**Table 2: Distribution of ALC grades: Showell Farm**

| Grade | Area (ha) | % of Survey Area | % of Agricultural Land | |
|---|---|---|---|---|
| 1 | 4.3 | 28.5 | 28.5 | |
| 2 | 7.5 | 49.7 | 49.7 | |
| 3b | 3.3 | 21.8 | 21.8 | |
| TOTAL | 15.1 | 100% | 100% | (15.1 ha) |

### Grade 1

Land of this grade comprises deep well drained clay loam profiles. These soils show no evidence of wetness and impose no drought restrictions. This land has no or very minor limitations.

### Grade 2

Nearly half of the site comprises land with a minor limitation. Most of the soils of this grade have a slight wetness limitation imposed by slowly permeable clay subsoils of approximately 60 cm depth. These soils are assessed as Wetness Class II (Appendix III) and Grade 2.

There are some well drained stonier soils in the Grade 2 mapping unit which were assessed as having between 30 and 50% limestone at depth and experience a slight drought limitation.

### Subgrade 3b

A strip of poorly drained clayey soils dissects the Grade 2 land. These soils are assessed as Wetness Class IV and experience a moderately severe wetness limitation.

Resource Planning Team
Taunton Statutory Unit
February 1994

## APPENDIX 1

## REFERENCES

BRITISH GEOLOGICAL SURVEY (1990) Solid and Drift Edition, Sheet 265, Bath 1:50,000

MAFF (1970) Agricultural Land Classification Map, Sheet 156, 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) *Climatological Data for Agricultural Land Classification.*

SOIL SURVEY OF ENGLAND AND WALES (1983) *Sheet 5, Soils of South West England, 1:250,000* scale.

## APPENDIX 2

## DESCRIPTION OF GRADES AND SUBGRADES

### 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 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 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 level of yields. It is mainly suited to grass with occasional arable crops (eg cereals and forage crops) the yields 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.

### Descriptions of other land categories used on ALC maps

### Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture including: housing, industry, commerce, education, transport, religious buildings, cemeteries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

**Non-agricultural**

'Soft' uses where most of the land could be returned relatively easily to agriculture, including: private park land, public open spaces, sports fields, allotments and soft-surfaced areas on airports/airfields. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

**Agricultural buildings**

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (eg polythene tunnels erected for lambing) may be ignored.

**Open water**

Includes lakes, ponds and rivers as map scale permits.

**Land not surveyed**

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above landcover types, eg buildings in large grounds, and where may be shown separately. Otherwise, the most extensive cover type will usually be shown.

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

## APPENDIX 3

## DEFINITION OF SOIL WETNESS CLASSES

### Wetness Class I

The soil profile is not wet within 70 cm depth for more than 30 days in most years.

### Wetness Class 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 not wet within 40 cm depth for more than 30 days in most years.

### Wetness Class 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 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 and 90 days in most years.

### Wetness Class IV

The soil profile is wet within 70 cm depth for more than 180 days but not within 40 cm depth for more than 210 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.

### Wetness Class V

The soil profile is wet within 40 cm depth for 211-335 days in most years.

### Wetness Class VI

The soil profile is wet within 40 cm depth for more than 335 days in most years.

**Notes:** The number of days specified is not necessarily a continuous period. 'In most years' is defined as more than 10 out of 20 years.

**Source:** Hodgson, J M (in preparation), Soil Survey Field Handbook (revised edition).

| SITE NAME | PROFILE NO. | SLOPE AND ASPECT | LAND USE | | PARENT MATERIAL |
|---|---|---|---|---|---|
| Showell Farm | Pit 1 | 0° | Ley | Av Rainfall: 739 mm<br>ATO: 1489 day °C | Kellaway Clays |
| JOB NO. | DATE | GRID REFERENCE | DESCRIBED BY | FC Days: 168<br>Climatic Grade: 1 | SOIL SAMPLE REFERENCES |
| 4/95 | 27/1/95 | ST 912 702 | N A Done | Exposure Grade: 1 | NAD 190 + 191 |

| Horizon No. | Lowest Av. Depth (cm) | Texture | Matrix (Ped Face) Colours | Stoniness: Size,Type, and Field Method | Mottling Abundance, Contrast. Size and Colour | Mangan Concs | Structure: Ped Development Size and Shape | Consistence | Structural Condition | Pores (Fissures) | Roots: Abundance and Size | Calcium Carbonate Content | Horizon Boundary: Distinctness and form |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 20 | MCL | 10YR43 | none | none | none | - | - | - | G | Many fine + v. fine | - | Clear/ smooth |
| 2 | 60 | MCL | 10YR46 | none | none | none | MDCAB | Friable | M | G | Many fine + v. fine | - | Gradual/ smooth |
| 3 | 120 | C | 10YR53 | none | MDOM 10YR58 | none | MDCAB | Friable | M | P | Common fine | - | |

Profile Gleyed From: 60

Depth to Slowly Permeable Horizon: 60

Wetness Class: II

Wetness Grade: 2

Available Water Wheat: 142 mm

Potatoes: 116 mm

Moisture Deficit Wheat: 104 mm

Potatoes: 97 mm

Moisture Balance Wheat: 38 mm

Potatoes: 20 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 2

Main Limiting Factor(s): Wetness

Remarks:

NL336k

| SITE NAME | PROFILE NO. | SLOPE AND ASPECT | LAND USE | | PARENT MATERIAL |
|---|---|---|---|---|---|
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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 20 | MCL | 10YR43 | none | none | none | - | - | - | G | Many fine + v. fine | - | Clear/ smooth |
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Droughtiness Grade: 1 (Calculated to 120 cm)

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Main Limiting Factor(s): Wetness

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