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Moredon Bridge, Swindon
Agricultural Land Classification

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Resource Planning Team
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MOREDON BRIDGE, SWINDON
AGRICULTURAL LAND CLASSIFICATION SURVEY

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MOREDON BRIDGE, SWINDON

AGRICULTURAL LAND CLASSIFICATION SURVEY

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 21.9 ha of land at Moredon Bridge, Swindon. Field survey was based on 21 auger borings and 1 soil profile pit, and was completed in April 1997.
2. The survey was conducted by the Resource Planning Team of FRCA Western Region on behalf of MAFF in its statutory role in connection with an application to the Planning Authority under the Town and Country Planning Act, 1990 for residential development.
3. Information on climate, geology and soils, and from previous ALC surveys was considered and is presented in the relevant section. Apart from the published regional ALC map (MAFF, 1977), which shows the site at a reconnaissance scale as Grade 3 in the south and Grade 4 in the north, the site had not been surveyed previously. However, the current survey uses the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF, 1988) and supersedes any previous ALC survey. Grade descriptions are summarised in Appendix I.
4. At the time of survey land cover was permanent grassland with some not recently farmed. Two small areas of woody vegetation are mapped as other land.

SUMMARY

5. The distribution of ALC grades is shown on the accompanying 1:10 000 scale ALC map. The detail of information shown at this scale is appropriate to the intensity of field survey but could be misleading if enlarged or applied to small areas. Areas are summarised in the Table 1.

Table 1: Distribution of ALC grades: Moredon Bridge, Swindon

| Grade | Area (ha) | % Surveyed Area (... ha) |
|-----------------|-----------|--------------------------|
| 3b | 20.7 | 100 |
| Other land | 1.2 | |
| Total site area | 21.9 | |

6. All of the site is classified as Subgrade 3b. The heavy clay loam and clay topsoils lie over slowly permeable clay subsoils. The soils experience a moderate wetness limitation.

CLIMATE

7. Estimates of climatic variables for this site were derived from the published agricultural climate dataset "Climatological Data for Agricultural Land Classification" (Meteorological Office, 1989) using standard interpolation procedures. Data for the site is given in Table 2 below.

AGRICULTURAL LAND CLASSIFICATION

14. The distribution of ALC grades found by the current survey is shown on the accompanying 1:10 000 scale map and areas are summarised in Table 1. The detail of information shown at this scale is appropriate to the intensity of field survey but could be misleading if enlarged or applied to small areas.

Subgrade 3b

15. All the soils have been mapped as Subgrade 3b; moderate quality agricultural land. Heavy clay loam and occasionally clay topsoils lie over clay subsoils. The subsoil was generally gleyed from below the topsoil and was also slowly permeable. This was confirmed in a soil profile pit. These soils are assessed as Wetness Class IV (See Appendix I). Some of the soils in the areas mapped as having underlying geology of silt and sand, were not gleyed until deeper in the profile. These soils were assessed as Wetness Class III. In either case the soils are Subgrade 3b. In the areas mapped as Coral Rag the soils were slightly stony but still poorly drained. Where the soils had been possibly disturbed on the raised areas in the south similar poorly drained soils were also found.

G M Shaw
Resource Planning Team
FRCA Bristol
April 1997

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APPENDIX I

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.

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

APPENDIX II

DEFINITION OF SOIL WETNESS CLASSES

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile.

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 Moredon Bridge, Swindon | | PROFILE NO. Pit 1 | SLOPE AND ASPECT 0° | LAND USE PGR | Av Rainfall: 684 mm ATO: 1429 day °C FC Days: 155 Climatic Grade: 1 Exposure Grade: 1 | PARENT MATERIAL Coral Rag |
| JOB NO. 24/97 | | DATE 3/4/97 | GRID REFERENCE SU 1206 8695 | DESCRIBED BY GMS | | PSD SAMPLES TAKEN - |

| 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 | 32 | HCL | 10YR41 | None | None | None | - | - | - | - | MF, VF | - | Clear smooth |
| 2 | 60+ | C | 2.5Y53 | 5% HR (VIS) | CDFOG 10YR56 2.5Y51 becoming many | None | MCAB | Firm | Poor | Poor | CVF | - | - |

Profile Gleyed From: 32 cm

Depth to Slowly Permeable Horizon: 32 cm

Wetness Class: IV

Wetness Grade: 3b

Available Water Wheat: 87 mm

Potatoes: 92 mm

Moisture Deficit Wheat: 104 mm

Potatoes: 95 mm

Moisture Balance Wheat: -17 mm

Potatoes: -3 mm

Droughtiness Grade: 3a (Calculated to 60 cm)

Final ALC Grade: 3b

Main Limiting Factor(s): Wetness

Remarks: Calcareous stones

APPENDIX III

ABBREVIATIONS AND TERMS USED IN SURVEY DATA

Soil pit and auger boring information collected during ALC survey is held on a computer database and is reproduced in this report. Terms used and abbreviations are set out below. These conform to definitions contained in the Soil Survey Field Handbook (Hodgson, 1974).

1. Terms used on computer database, in order of occurrence.

GRID REF: National 100 km grid square and 8 figure grid reference.

LAND USE: At the time of survey

| | | |
|--------------------------|---------------------------------|-------------------------------------|
| WHT: Wheat | SBT: Sugar Beet | HTH: Heathland |
| BAR: Barley | BRA: Brassicas | BOG: Bog or Marsh |
| OAT: Oats | FCD: Fodder Crops | DCW: Deciduous Wood |
| CER: Cereals | FRT: Soft and Top Fruit | CFW: Coniferous Woodland |
| MZE: Maize | HRT: Horticultural Crops | PLO: Ploughed |
| OSR: Oilseed Rape | LEY: Ley Grass | FLW: Fallow (inc. Set aside) |
| POT: Potatoes | PGR: Permanent Pasture | SAS: Set Aside (where known) |
| LIN: Linseed | RGR: Rough Grazing | OTH: Other |
| BEN: Field Beans | SCR: Scrub | |

GRDNT: Gradient as estimated or measured by hand-held optical clinometer.

GLEY, SPL: Depth in centimetres to gleying or slowly permeable layer.

AP (WHEAT/POTS): Crop-adjusted available water capacity.

MB (WHEAT/POTS): Moisture Balance. (Crop adjusted AP - crop potential MD)

DRT: Best grade according to soil droughtiness.

If any of the following factors are considered significant, 'Y' will be entered in the relevant column.

| | | |
|-------------------------------------|---------------------------|---------------------------------|
| MREL: Microrelief limitation | FLOOD: Flood risk | EROSN: Soil erosion risk |
| EXP: Exposure limitation | FROST: Frost prone | DIST: Disturbed land |
| CHEM: Chemical limitation | | |

LIMIT: The main limitation to land quality: The following abbreviations are used.

| | | |
|----------------------------|---------------------|------------------------|
| OC: Overall Climate | AE: Aspect | EX: Exposure |
| FR: Frost Risk | GR: Gradient | MR: Microrelief |

| | | | | | |
|------------|-------------------|------------|-----------------|------------|------------------------------|
| FL: | Flood Risk | TX: | Topsoil Texture | DP: | Soil Depth |
| CH: | Chemical | WE: | Wetness | WK: | Workability |
| DR: | Drought | ER: | Erosion Risk | WD: | Soil Wetness/Droughtiness |
| ST: | Topsoil Stoniness | | | | |

TEXTURE: Soil texture classes are denoted by the following abbreviations:-

| | | | | | |
|-------------|-----------------|-------------|---------------|-------------|--------------------|
| S: | Sand | LS: | Loamy Sand | SL: | Sandy Loam |
| SZL: | Sandy Silt Loam | CL: | Clay Loam | ZCL: | Silty Clay Loam |
| ZL: | Silt Loam | SCL: | Sandy Loam | C: | Clay |
| SC: | Sandy clay | ZC: | Silty clay | OL: | Organic Loam |
| P: | Peat | SP: | Sandy Peat | LP: | Loamy Peat |
| PL: | Peaty Loam | PS: | Peaty Sand | MZ: | Marine Light Silts |

For the sand, loamy sand, sandy loam and sandy silt loam classes, the predominant size of sand fraction will be indicated by the use of the following prefixes:-

| | |
|-----------|--|
| F: | Fine (more than 66% of the sand less than 0.2mm) |
| M: | Medium (less than 66% fine sand and less than 33% coarse sand) |
| C: | Coarse (more than 33% of the sand larger than 0.6mm) |

The clay loam and silty clay loam classes will be sub-divided according to the clay content: **M:** Medium (< 27% clay) **H:** heavy (27 - 35% clay)

MOTTLE COL: Mottle colour using Munsell notation.

MOTTLE ABUN: Mottle abundance, expressed as a percentage of the matrix or surface described.

F: few <2% **C:** common 2 - 20% **M:** many 20 - 40% **VM:** very many 40%+

MOTTLE CONT: Mottle contrast

| | |
|-----------|---|
| F: | faint - indistinct mottles, evident only on close inspection |
| D: | distinct - mottles are readily seen |
| P: | Prominent - mottling is conspicuous and one of the outstanding features of the horizon. |

PED. COL: Ped face colour using Munsell notation.

GLEYS: If the soil horizon is gleyed a 'Y' will appear in this column. If slightly gleyed, an 'S' will appear.

STONE LITH: Stone Lithology - One of the following is used.

| | | | |
|------------|---------------------------|--------------|-------------------------------------|
| HR: | All hard rocks and stones | SLST: | Soft oolitic or dolimitic limestone |
|------------|---------------------------|--------------|-------------------------------------|

| | | | |
|--------------|--|--------------|--------------------------------------|
| CH: | Chalk | FSST: | Soft, fine grained sandstone |
| ZR: | Soft, argillaceous, or silty rocks | GH: | Gravel with non-porous (hard) stones |
| MSST: | Soft, medium grained sandstone | GS: | Gravel with porous (soft) stones |
| SI: | Soft weathered igneous or metamorphic rock | | |

Stone contents are given in % by volume for sizes >2cm, >6cm and total stone >2mm.

STRUCT: The degree of development, size and shape of soil pedes are described using the following notation

| | | |
|-------------------------------------|--------------------------------|---------------------------------|
| <u>Degree of development</u> | WK: Weakly developed | MD: Moderately developed |
| | ST: Strongly developed | |
| <u>Ped size</u> | F: Fine | M: Medium |
| | C: Coarse | VC: Very coarse |
| <u>Ped Shape</u> | S: Single grain | M: Massive |
| | GR: Granular | AB: Angular blocky |
| | SAB: Sub-angular blocky | PR: Prismatic |
| | PL: Platy | |

CONSIST: Soil consistence is described using the following notation:

| | | | |
|----------------------|---------------------------|---------------------------|-----------------|
| L: Loose | VF: Very Friable | FR: Friable | FM: Firm |
| VM: Very firm | EM: Extremely firm | EH: Extremely Hard | |

SUBS STR: Subsoil structural condition recorded for the purpose of calculating profile droughtiness: **G:** Good **M:** Moderate **P:** Poor

POR: Soil porosity. If a soil horizon has poor porosity with less than 0.5% biopores >0.5mm, a 'Y' will appear in this column.

IMP: If the profile is impenetrable to rooting a 'Y' will appear in this column at the appropriate horizon.

SPL: Slowly permeable layer. If the soil horizon is slowly permeable a 'Y' will appear in this column.

CALC: If the soil horizon is calcareous with naturally occurring calcium carbonate exceeding 1% a 'Y' will appear this column.

2. Additional terms and abbreviations used mainly in soil pit descriptions.

STONE ASSESSMENT:

VIS: Visual **S:** Sieve **D:** Displacement

MOTTLE SIZE:

| | |
|--------------------------------|-------------------------|
| EF: Extremely fine <1mm | M: Medium 5-15mm |
| VF: Very fine 1-2mm> | C: Coarse >15mm |
| F: Fine 2-5mm | |

MOTTLE COLOUR: May be described by Munsell notation or as ochreous (OM) or grey (GM).

ROOT CHANNELS: In topsoil the presence of 'rusty root channels' should also be noted.

MANGANESE CONCRETIONS: Assessed by volume

| | | |
|------------------------|----------------------|--------|
| N: None | M: Many | 20-40% |
| F: Few <2% | VM: Very Many | >40% |
| C: Common 2-20% | | |

STRUCTURE: Ped Development *

| | |
|----------------------------|--------------------------------|
| WA: Weakly adherent | M: Moderately developed |
| W: Weakly developed | S: Strongly developed |

POROSITY:

P: Poor - less than 0.5% biopores at least 0.5mm in diameter
G: Good - more than 0.5% biopores at least 0.5mm in diameter

ROOT ABUNDANCE:

| The number of roots per 100cm ² : | | Very Fine and Fine | Medium and Coarse |
|--|----------|--------------------|-------------------|
| F: | Few | 1-10 | 1 or 2 |
| C: | Common | 10.25 | 2 - 5 |
| M: | Many | 25-200 | >5 |
| A: | Abundant | >200 | |

ROOT SIZE

| | |
|---------------------------|--------------------------|
| VF: Very fine <1mm | M: Medium 2 - 5mm |
| F: Fine 1-2mm | C: Coarse >5mm |

HORIZON BOUNDARY DISTINCTNESS:

| | |
|----------------------------|--------------------------|
| Sharp: <0.5cm | Gradual: 6 - 13cm |
| Abrupt: 0.5 - 2.5cm | Diffuse: >13cm |
| Clear: 2.5 - 6cm | |

HORIZON BOUNDARY FORM: Smooth, wavy, irregular or broken.*

* See Soil Survey Field Handbook (Hodgson, 1974) for details.