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M5/M42 Interchange, Bromsgrove

Agricultural Land Classification

May 1997

Resource Planning Team
Bristol
FRCA Western Region

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M5/M42 INTERCHANGE, BROMSGROVE
AGRICULTURAL LAND CLASSIFICATION SURVEY

CONTENTS

| | Page |
|---|---|
| INTRODUCTION | 1 |
| SUMMARY | 1 |
| CLIMATE | 2 |
| RELIEF | 2 |
| GEOLOGY AND SOILS | 3 |
| AGRICULTURAL LAND CLASSIFICATION AND MAP | 3 |
| REFERENCES | 5 |
| APPENDIX I Description of the Grades and Subgrades | 6 |
| APPENDIX II Definition of Soil Wetness Classes | 8 |
| APPENDIX III Survey Data: | 9 |
| | Sample Point Location Map |
| | Pit Descriptions |
| | Boring Profile Data |
| | Boring Horizon Data |
| | Abbreviations and Terms used in Survey Data |

M5/M42 INTERCHANGE, BROMSGROVE

AGRICULTURAL LAND CLASSIFICATION SURVEY

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 36.8 ha of land at Bromsgrove. Field survey was based on 35 auger borings and 4 soil profile pits, and was completed in May 1997.
2. The survey was conducted by the Resource Planning Team of FRCA Western Region on behalf of MAFF in its statutory role in the preparation of the Bromsgrove District Local Plan.
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 largely Grade 2 in the north, Grade 1 in the south and Grade 3 along Battlefield Brook, the site was previously surveyed in 1983 at a scale of 1:25 000 (ADAS, 1983). 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. Four surveys using the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF 1988) have been carried out on areas of land adjacent to the site. These are ADAS (1989, 1995 and 1996). Attention was paid to the grading of the land from these surveys for the grading of the land from the present survey.
5. At the time of survey land cover was grassland and ploughed. Other land which was not surveyed included farm and residential buildings and surfaced trackways.

SUMMARY

6. 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: M5/M42 Interchange, Bromsgrove

| Grade | Area (ha) | % Surveyed Area (33.8 ha) |
|-----------------|-----------|---------------------------|
| 1 | 10.4 | 30.8 |
| 2 | 12.7 | 37.6 |
| 3a | 10.7 | 31.6 |
| Other land | 3.0 | . |
| Total site area | 36.8 | . |

7. The agricultural land across the site has been graded wholly as best and most versatile. Subgrade 3a land occurs in the isolated areas in the east and west of the site. These soils have moderate limitations due to soil droughtiness, in the east due to the stony nature of the subsoils and in the west due to severe subsoil compaction resulting from soil movement and replacement, and limited depth of soil onto sandstone. The rest of the site is mapped as Grade 1 and Grade 2 with no or minor limitations to the soils agricultural use.

CLIMATE

8. 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 key points around the site are given in Table 2 below.

9. Since the ALC grade of land is determined by the most limiting factor present, overall climate is considered first because it can have an overriding influence by restricting land to a lower grade despite more favourable site and soil conditions. Parameters used for assessing overall climate are accumulated temperature, a measure of relative warmth and average annual rainfall, a measure of overall wetness. The results shown in Table 2 indicate that there is no overall climatic limitation.

10. Climatic variables also affect ALC grade through interactions with soil conditions. The most important interactive variables are Field Capacity Days (FCD) which are used in assessing soil wetness and potential Moisture Deficits calculated for wheat and potatoes, which are compared with the moisture available in each profile in assessing soil droughtiness limitations. These are described in later sections.

Table 2: Climatic Interpolations: M5/M42 Interchange, Bromsgrove

| Grid Reference | SO 956 727 | SO 952 722 |
|----------------------------------|------------|------------|
| Altitude (m) | 115 | 105 |
| Accumulated Temperature (day °C) | 1366 | 1377 |
| Average Annual Rainfall (mm) | 716 | 704 |
| Overall Climatic Grade | 1 | 1 |
| Field Capacity Days | 170 | 166 |
| Moisture deficit (mm): | | |
| Wheat | 94 | 96 |
| Potatoes | 82 | 84 |

RELIEF

11. Altitude ranges from 105 metres in the south west to 115 metres in the north with no restriction to the agricultural use of the land in relation to slope.

GEOLOGY AND SOILS

12. The underlying geology of the site is shown on the published geology map (IGS, 1976) as Lower Keuper sandstone, with alluvium along Battlefield Brook. The recent survey found the soils across the site to be variably sandy and only reaching sandstone in the south west of the site north of Perryfields Road.

13. Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1:250 000 (SSEW, 1984) as Wigton Moor over the area mapped as alluvium and Bromsgrove Association over the remainder of the area.

14. The Bromsgrove Association is described as well-drained coarse loamy soils mainly over soft sandstone, but deep in places. Wigton Moor soils are permeable fine and coarse loamy soils.

15. The majority of the soils described in the present survey were deep and well drained, occasionally passing into sandstone at shallower depths. Soils described where the alluvium is mapped were found to be gleyed but well drained.

AGRICULTURAL LAND CLASSIFICATION

16. 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.

Grade 1

17. Two significant areas of excellent quality agricultural land were identified in the recent survey. In the north west soils were found to be sandy but were neither limited by soil droughtiness nor soil wetness. In the south east soils were heavier, particularly the subsoils but a profile pit confirmed that there was no wetness and the soils were assessed as Wetness Class I (See Appendix II).

Grade 2

18. Land of good quality has a more scattered distribution across the site and the soils are variably limited. Across the east and extreme south west of the site the sandy loam and clay loam topsoils pass onto heavier subsoils, these soils are assessed as Wetness Class II. In the centre and central south of the site sandstone is encountered at depth in the profiles and the soils are limited by soil droughtiness.

Subgrade 3a

19. Two distinct areas of moderate quality land were identified in the recent survey. In the east of the survey area, and confirmed by a profile pit, sandy loam and clay loam topsoils overlie heavier but very stony subsoils, which imposed a droughtiness limitation. Across the west of the site, the Subgrade 3a soils fell into two distinct categories; those to the south of Battlefield Brook which a profile pit showed were encountering sandstone at shallow depths and those soils to the north of the Brook which had been subject to disturbance and replacement. A profile pit in this area confirmed this and highlighted the problem of severe subsoil compaction at depth. The soils in both these areas are limited in their agricultural use by soil droughtiness.

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May 1997

REFERENCES

ADAS RESOURCE PLANNING TEAM, (1983) Agricultural Land Classification Survey of Bromsgrove, Scale 1: 25 000, ADAS Wolverhampton.

ADAS RESOURCE PLANNING TEAM, (1989) Agricultural Land Classification Survey of Perryfields, Scale 1: 10 000, Reference 29, ADAS Wolverhampton.

ADAS RESOURCE PLANNING TEAM, (1995) Agricultural Land Classification Survey of Norton Farm, Scale 1: 10 000, References 46 & 47, ADAS Wolverhampton.

ADAS RESOURCE PLANNING TEAM, (1996) Agricultural Land Classification Survey of Catshill, Scale 1: 10 000, Reference 20, ADAS Wolverhampton.

INSTITUTE OF GEOLOGICAL SCIENCES (1976), Sheet 182, Droitwich, 1:50 000 series Solid and Drift edition, IGS, London.

HODGSON, J M (Ed) (1974) Soil Survey Field Handbook, Technical Monograph No 5. Soil Survey of England and Wales, Harpenden.

HODGSON, J M (In preparation) Soil Survey Field Handbook, Revised edition.

MAFF (1977) 1:250 000 series Agricultural Land Classification, South West Region. MAFF Publications, Alnwick.

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

METEOROLOGICAL OFFICE (1989) Climatological Data for Agricultural Land Classification. Meteorological Office, Bracknell.

SOIL SURVEY OF ENGLAND AND WALES (1984) Sheet 3, Soils of Midland and Western England, 1:250 000 scale. SSEW, Harpenden.

SOIL SURVEY OF ENGLAND AND WALES (1984) Soils and Their Use in Midland and Western England, Bulletin No 12. SSEW, Harpenden.

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.

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 Clay 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 peds 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.

| | | | | | | |
|--------------------------------|--|-------------|------------------|--------------|---------------------|-------------------|
| SITE NAME | | PROFILE NO. | SLOPE AND ASPECT | LAND USE | Av Rainfall: 716 mm | PARENT MATERIAL |
| M5/M42 Interchange, Bromsgrove | | Pit 1 | 0° | PGR | ATO: 1366 day °C | |
| JOB NO. | | DATE | GRID REFERENCE | DESCRIBED BY | FC Days: 170 | PSD SAMPLES TAKEN |
| 34/97 | | 1/5/97 | SO 956 724 | SH/GMS | Climatic Grade: 1 | |
| | | | | | Exposure Grade: 1 | None |

| 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 | 25 | MCL | 7.5YR32 | None (VIS) | None | None | - | - | - | - | MVF | - | Sharp wavy |
| 2 | 44 | MCL | 10YR62 | <1% HR (VIS) | MDFO 7.5YR56 | None | MCSAB | Friable | Moderate | Low (patchy) | CVF | - | Sharp smooth |
| 3 | 55 | MSL | 2.5Y62 | 3% HR (VIS) | MDFO 7.5YR56 | Few | MCSAB | V Friable | Moderate | Good | CVF | - | Abrupt wavy |
| 4 | 80+ | MS | 2.5Y62 | 55% HR (VIS) | None | None | Too stony and loose | V Friable | Moderate | Good | CVF | - | - |

Profile Gleyed From: 25 cm

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: II (since most profiles predom not coarse above 80 cm)

Wetness Grade: 2

Available Water Wheat: 103 mm

Potatoes: 96 mm

Moisture Deficit Wheat: 94 mm

Potatoes: 82 mm

Moisture Balance Wheat: 7 mm

Potatoes: 14 mm

Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 2

Main Limiting Factor(s): Wetness and Droughtiness

Remarks:

| | | | | | | |
|--------------------------------|--|-------------|------------------|--------------|---------------------|------------------------|
| SITE NAME | | PROFILE NO. | SLOPE AND ASPECT | LAND USE | Av Rainfall: 716 mm | PARENT MATERIAL |
| M5/M42 Interchange, Bromsgrove | | Pit 2 | 0° | Pasture | ATO: 1366 day °C | Lower Keuper Sandstone |
| JOB NO. | | DATE | GRID REFERENCE | DESCRIBED BY | FC Days: 170 | PSD SAMPLES TAKEN |
| 34/97 | | 1/5/97 | SO 953 724 | GS/SH | Climatic Grade: 1 | None |
| | | | | | Exposure Grade: 1 | |

| 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 | 30 | MCL (sandy) | 5YR3/3 mixed with 25YR46 from below | 2% HR Mixed stone material | - | - | - | - | - | - | Many fine fibres and very fine | - | Clear irregular |
| 2 <i>from 50 cm very compactd although material can be removed</i> | 60 Pit dug to 60 | MSL | 2.5YR46 +2.5YR34 | 8% HR Large angular pieces of stone, brick etc | - | - | - | - | - | - | Few fine fibrous roots last observed at 48 cm | - | - |

| | | | |
|---|------------------------|-----------------------|---|
| Profile Gleyed From: Not gleyed | Available Water | Wheat: 91 mm | Final ALC Grade: 3a |
| Depth to Slowly Permeable Horizon: No SPL | | Potatoes: 95 mm | Main Limiting Factor(s): Droughtiness due to severe subsoil compaction at 60 cm |
| Wetness Class: - | Moisture Deficit | Wheat: 94 mm | |
| Wetness Grade: - | | Potatoes: 82 mm | Remarks: Disturbed profile. Replaced topsoil material overlying compacted fill. |
| | Moisture Balance | Wheat: -3 mm | |
| | | Potatoes: 13 mm | |
| | Droughtiness Grade: 3a | (Calculated to 60 cm) | |

| | | | | | | |
|--------------------------------|--|-------------|------------------|--------------|---------------------|------------------------|
| SITE NAME | | PROFILE NO. | SLOPE AND ASPECT | LAND USE | Av Rainfall: 716 mm | PARENT MATERIAL |
| M5/M42 Interchange, Bromsgrove | | Pit 3 | 0° | PGR | ATO: 1366 day °C | Lower Keuper Sandstone |
| JOB NO. | | DATE | GRID REFERENCE | DESCRIBED BY | FC Days: 170 | PSD SAMPLES TAKEN |
| 34/97 | | 1/5/97 | SO 954 722 | SH/GMS | Climatic Grade: 1 | None |
| | | | | | Exposure Grade: 1 | |

| 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 | 35 | MSL | 0.5YR42 | 1% HR (VIS) | None | None | - | - | - | - | MF, VF | - | Sharp wavy |
| 2 | 48 | SCL | 5YR54 | 3% HR (VIS) | None | None | MCSAB (35-45 cm) C Platy (45 cm+) | Firm | Moderate/poor | Good (35-45) | FM, CVF | - | Sharp smooth |
| 3 | 48+ | Sandstone | - | - | - | - | - | - | - | Good | - | - | - |

Profile Gleyed From: Not gleyed

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: I

Wetness Grade: 1

Available Water Wheat: 80 mm

Potatoes: 81 mm

Moisture Deficit Wheat: 94 mm

Potatoes: 82 mm

Moisture Balance Wheat: -14 mm

Potatoes: -1 mm

Droughtiness Grade: 3a (Calculated to 60 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Droughtiness

Remarks: Slight plough pan
Platy structure related to weathering sandstone

| | | | | | | |
|--|--|----------------------|-----------------------------------|---------------------|---|---|
| SITE NAME M5/M42 Interchange, Bromsgrove | | PROFILE NO. Pit 4 | SLOPE AND ASPECT 2° North East | LAND USE Pasture | Av Rainfall: 716 mm ATO: 1366 day °C FC Days: 170 Climatic Grade: 1 Exposure Grade: 1 | PARENT MATERIAL Lower Keuper Sandstone |
| JOB NO. 34/97 | | DATE 7/5/97 | GRID REFERENCE SO 957 725 | DESCRIBED BY SH | | PSD SAMPLES TAKEN None |

| 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 | 28 | MSL/ MCL | 5YR3/2 | <1% HR | None | None | - | - | - | - | m fine fib | - | Abrupt smooth |
| 2 | 65 | MSL | 5YR3/3 5YR42/52 | <1% HR | None | None | Mod CAB | Fr | Mod | > 0.5 | m fine fib | - | Abrupt smooth |
| 3 | 80 | SCL | 25YR3/4 | 2% HR | None | None | Mod CSB | Fr | Mod | > 0.5 | c fine fib | - | Abrupt wavy |
| 4 | 80+85 v thin | SCL band of | 5YR3/4 stone | 10% HR -12% | None | None | - | Fr | Mod | > 0.5 | f fine fib | - | Abrupt smooth |
| 5 | 94 | MSL | 5YR3/4 -44 + 75YR5/3 | - | 5YR5/6 Common | None | Mod CSB | Fm | Mod | > 0.5 | f fine fib | - | Abrupt smooth |
| 6 | 120 | SCL/C | 25YR3/4 | - | None | None | Mod CSB | - | - | > 0/5 | f fine fib | - | - |

Profile Gleyed From: Not gleyed

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: I

Wetness Grade: 1

Available Water Wheat: 154 mm

Potatoes: 112 mm

Moisture Deficit Wheat: 94 mm

Potatoes: 82 mm

Moisture Balance Wheat: 60 mm

Potatoes: 30 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 1

Main Limiting Factor(s):

Remarks: