8FCS 8188

Grafton Lane, Bromsgrove

Agricultural Land Classification

May 1997

Resource Planning Team
Bristol
FRCA Western Region

Job Number 31/97

MAFF Reference EL 17/0089a

GRAFTON LANE, BROMSGROVE

AGRICULTURAL LAND CLASSIFICATION SURVEY

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INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 148.4 ha of land at Grafton Lane, Bromsgrove. Field survey was based on 148 auger borings and 4 soil profile pits, and was completed in May 1997. During the survey 2 samples were analysed for particle size distribution (PSD).

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 being all Grade 3, 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 grassland, cereals and beans. An area of 3.2 ha of agricultural land within the survey area was not surveyed because access was not given and ownership could not be established. Other land which was not surveyed included residential housing and roadways.

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: Grafton Lane, Bromsgrove

Grade	Area (ha)	% Surveyed Area (132.4 ha)
2	1.6	1.2
3a	32.7	25.2
3b	90.4	70.1
4	4.5	3.5
Agricultural land not surveyed	3.2	
Other land	16.0	
Total site area	148.4	

6. The majority of the site is mapped as Subgrade 3b and Subgrade 3a. The Subgrade 3a land occurs in isolated areas across the site, together with a small strip of Grade 2 land. These soils have minor to moderate wetness limitations. The Subgrade 3b land also has moderate wetness, some droughtiness limitations and slope restrictions. The Grade 4 land around Breakback Hill is limited by gradient.

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

8. 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.

9. 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. A critical boundary of 151 FC Days was found in the south west of the site.

Table 2: Climatic Interpolations: Grafton Lane, Bromsgrove

Grid Reference		SO 947 694	SO 938 685	SO 941 690
Altitude (m)		*100*	*60*	*80*
Accumulated Temperature (day °C)		0384	1431	1407
Average Annual Rainfall (mm)		681	655	669
Overall Climatic Grade		1	1	1
Field Capacity Days		156	149	153
Moisture deficit (mm):	Wheat	97	105	101
	Potatoes	86	95	91

RELIEF

10. Altitude ranges from 60 metres in the south west of the site to 120 metres at Breakback Hill. The steepest land is in the north of the site where slopes limit the agricultural use of the land to Subgrade 3b and Grade 4. In the south of the site slopes are gentle.

GEOLOGY AND SOILS

11. The underlying geology of the site is shown on the published geology map (IGS, 1976) as mainly Keuper Marl, with some Lower Keuper sandstone near the north east corner of the site.

12. Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1:250 000 (SSEW, 1984) as Worcester Association. An area of soils from the Bromsgrove Association are mapped on the north east edge of the site.

13. The Worcester Association is described as slowly permeable non calcareous and calcareous reddish clays over mudstone. Bromsgrove soils are describrd as well drained reddish coarse loamy soils over sandstone which are deep in places and may be associated with slowly permeable layers.

14. The recent survey found soils developing in mudstone/marl across the majority of the site. The majority of the soils were poorly drained red clays. Some variation to this was found around East Lodge Farm where soils were shallow and developing over sandstone.

AGRICULTURAL LAND CLASSIFICATION

15. 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 2

16. An isolated strip of Grade 2, very good quality agricultural land, was identified in the recent survey. The soils were described as medium and heavy clay loam topsoils overlying heavy clay loam topsoils overlying heavy clay loams, and occasionally clay to depth. The soils were not gleyed and with no slowly permeable layer were assessed as Wetness Class I and II (See Appendix II).

Subgrade 3a

17. Several areas of good quality land were identified in the recent survey. These soils were described as having medium or heavy clay loam topsoils overlying heavy clay loam upper subsoils and red clay to depth occasionally reaching mudstone. Two soil profile pits confirmed both the clay and mudstone as being slowly permeable and the soils were assessed as Wetness Class II and III.

Subgrade 3b

18. The majority of the site has been mapped as land of moderate quality with heavy clay loam topsoils. These soils overlie slowly permeable red clays and mudstone with moderate wetness limitations. The red clays and mudstone were confirmed as being slowly permeable in two soil profile pits and the soils were assessed as Wetness Class III and Wetness Class IV.

19. In the north and north east of the site the sloping land has moderate gradient limitations.

Grade 4

20. A small area of poor quality land occurs around East Lodge Farm and Breakback Hill, here slope gradients exceeded 11°.

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May 1997

REFERENCES

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.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Grafton Lane, Bromsgrove	Pit 1 (ASP 52)	5° North	PGR	Av Rainfall: 669 mm ATO: 1407 day °C FC Days: 153 Climatic Grade: 1 Exposure Grade: 1	Keuper Marl
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY		PSD SAMPLES TAKEN
31/97	14/5/97	SO 942 693	SH/ GMS		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	35	MCL	5YR4/2	3% HR (VIS)	None	None	-	-	-	-	MF	-	Abrupt wavy
2	54	HCL	5YR4/4 (5YR54)	3% HR (VIS)	None	Common	STCSB	Firm	M	Low	CF (sides of peds)	-	Abrupt wavy
3	69	C	25YR46 (25YR54)	0% (VIS)	None	C - on ped faces of secondary peds	MD VCAB (CAB secondary peds)	Firm	P	Low	CVF	-	Clear smooth
4	90+	C	25YR4/6 (25YR54)	0% (VIS)	None	Few (on faces)	Hard mudstone weathered parts WFSAB where weathered	with less well at top mudstone is	M	-	CVF	-	-

Profile Gleyed From: Not gleyed

Depth to Slowly Permeable Horizon: 54 cm

Wetness Class: III

Wetness Grade: 3a

Available Water Wheat: 124 mm

Potatoes: 112 mm

Moisture Deficit Wheat: 101 mm

Potatoes: 91 mm

Moisture Balance Wheat: 23 mm

Potatoes: 15 mm

Droughtiness Grade: 2 (Calculated to 100 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Wetness

Remarks: Mudstone is hard but weathered at top, therefore assume with depth becomes less weathered, therefore more SPL like, therefore SPL at 100 cm+

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Grafton Lane, Bromsgrove	Pit 2 (ASP 99)	1° South	Cereals	Av Rainfall: 669 mm ATO: 1407 day °C FC Days: 153 Climatic Grade: 1 Exposure Grade: 1	Keuper Marl
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY		PSD SAMPLES TAKEN
31/97	15/5/97	SO 945 689	SH/ GMS		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	21	MCL	7.5YR42-3	5% HR (VIS)	None	None	-	-	-	-	ff	-	Abrupt smooth
2	35	HCL	7.5YR5/3	5% HR (VIS)	Many 7.5YR5/6-8	Many	WK CSB	Friable	Moderate	High	fvf	-	Clear smooth
3	45	C	5YR4/3-4	5% HR (VIS)	Many 5YR 4/6	Many	WK CSB	Firm	Poor	High	fvf	-	Clear smooth
4	75+	C	5YR4/4 (75YR5/3 -5YR5/3)	0% (VIS)	None	Many	WK CSB	Firm	Poor	Low	vf vf	-	-

Profile Gleyed From: 21cm

Depth to Slowly Permeable Horizon: 45cm

Wetness Class: III

Wetness Grade: 3a

Available Water Wheat: 125 mm

Potatoes: 102 mm

Moisture Deficit Wheat: 101 mm

Potatoes: 91 mm

Moisture Balance Wheat: 24 mm

Potatoes: 11 mm

Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Wetness

Remarks:

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Grafton Lane, Bromsgrove	Pit 3 (ASP 120)	1° West	Beans	Av Rainfall: 669 mm ATO: 1407 day °C	Keuper Marl
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 153 Climatic Grade: 1 Exposure Grade: 1	PSD SAMPLES TAKEN HCL/HZCL/MCL/MZCL S:20 Z:53 C:27
31/97	15/5/97	SO 942 687	GMS/ SH		

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	21	HCL	7.5YR4/3	3HR (VIS)	None	None	-	-	-	-	ff	-	Smooth abrupt
2	67	C	5YR4/3	3% HR VIS at top of horizon	None	None	MCSB to 40 cm WKCAB below 40 cm	Friable Firm	Moderate	High Low	fvf fvf	-	Smooth abrupt
3	100+	C	25YR4/4	0% (VIS)	None	Common	Larger from 80 cm.	unweathered Structure as	blocks H4 Pit 1	-	fvf	-	-

Profile Gleyed From: Not gleyed

Depth to Slowly Permeable Horizon: 40 cm (21)

Wetness Class: IV

Wetness Grade: 3b

Available Water Wheat: 121 mm

Potatoes: 113 mm

Moisture Deficit Wheat: 101 mm

Potatoes: 91 mm

Moisture Balance Wheat: 20 mm

Potatoes: 22 mm

Droughtiness Grade: 2 (Calculated to 100 cm)

Final ALC Grade: 3b

Main Limiting Factor(s): Wetness

Remarks: No pale ped faces in H2 or H3. Not gleyed. SPL in part of pit H2 (21-40) is not present so H2 is entirely SPL where H2 (21-40) not present

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Grafton Lane, Bromsgrove	Pit 4 (near ASP 79)	2°West	Beans	Av Rainfall: 669mm ATO: 1407 day °C	Keuper Marl
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 153 Climatic Grade: 1 Exposure Grade: 1	PSD SAMPLES TAKEN
31/97	15/5/97	SO 936 690	SH/GMS		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	HCL/C	5YR 3/2	<1% (VIS)	None	None	-	-	-	-	ff	-	Clear smooth
2	45	C	5YR 4/3 (5YR 5/2 - 4/2)	0% (VIS)	None	Few	MDCSB	Firm	M	low	fvf	-	Clear smooth
3	100+	C	5YR4/3 5YR4/4 5/5GY	0% (VIS)	None	C on ped face	MASSIVE	Friable	-	-	-	-	

Profile Gleyed From: Not gleyed

Depth to Slowly Permeable Horizon: 45cm

Wetness Class: III

Wetness Grade: 3b

Available Water	Wheat:	118 mm
	Potatoes:	109 mm
Moisture Deficit	Wheat:	101 mm
	Potatoes:	91 mm
Moisture Balance	Wheat:	17 mm
	Potatoes:	12 mm

Droughtiness Grade: 1 (Calculated to 100 cm)

Final ALC Grade: 3b

Main Limiting Factor(s): Wetness

Remarks: *Ped development in H3 is very limited, more like weathering parent material (see p79 Soil Survey Handbook Horizon notation C) Massive FR structure for ALC terms*

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.

GLEY: 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

Degree of development	**WK:**	Weakly developed	**MD:**	Moderately developed
	ST:	Strongly developed		
Ped size	**F:**	Fine	**M:**	Medium
	C:	Coarse	**VC:**	Very coarse
Ped Shape	**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.