Keynsham

Agricultural Land Classification

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FRCA Western Region

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KEYNSHAM

AGRICULTURAL LAND CLASSIFICATION SURVEY

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INTRODUCTION

1. This report presents the findings of a semi-detailed Agricultural Land Classification (ALC) survey of 1402.3 ha of land at Keynsham and Saltford. Field survey was based on 490 auger borings and 20 soil profile pits, and was completed in August 1997. During the survey seven 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 replacement structure plan for the county previously known as Avon.

3. Information on climate, geology and soils, and from previous ALC surveys was considered and is presented in the relevant sections. The published regional ALC map (MAFF 1977) shows the site at a reconnaissance scale. Grade 4 is mapped along the eastern part of the River Avon and in the steep valley at Chewton Keynsham. Grade 2 is shown on the higher part of the flood plain and at Stockwood Vale with the rest of the site being Grade 3. The current survey uses the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF 1988) and therefore supersedes any previous ALC survey. Grade descriptions are summarised in Appendix I.

4. Part of the site was previously surveyed in 1984 at a scale of 1: 25 000 (ADAS 1984). This survey mapped land between Keynsham and Saltford, to the south of the railway line. It was shown as Subgrade 3a to the west of Eastover Farm and Subgrade 3b elsewhere due to variable moderate drought and soil depth limitations. A band of land on the western and southern edges of Keynsham was also surveyed and mapped as Subgrades 3b and 3c due to variable moderate drought, soil depth and wetness limitations. During the recent survey, using the current criteria, there was no evidence to suggest a change in the overall quality of the land across these areas, although no distiction could be made between the different subgrades.

5. At the time of survey land cover was mainly arable on the limestone plateau, grassland elsewhere and some horticulture in Stockwood Vale. An area of 130.0 ha of agricultural land within the survey area was not surveyed because of access restrictions.

6. Other land that was not surveyed included agricultural buildings and farmsteads, and residential areas. There is an industrial site near Burnett and a sewage works at Saltford Mead. The golf course and woodland in Stockwood Vale, and the woodland elsewhere in the site are also unsurveyed.

SUMMARY

7. The distribution of ALC grades is shown on the accompanying 1: 20 000 scale ALC maps. 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: Keynsham

Grade	Area (ha)	% Surveyed Area (962.6 ha)
2	6.8	1
3a	139.8	14
3b	500.4	52
4	315.6	33
Agricultural land not surveyed	130.0	-
Other land	309.7	-
Total site area	1402.3	100

8. Only 13% of the site has been mapped as best and most versatile. This includes the small area of Grade 2 (very good quality) land in the Chew Valley where the profiles have a minor workability limitation. The rest of the best and most versatile land consists of the various areas of Subgrade 3a (good quality) land along the River Avon and in Stockwood Vale. These profiles have a combination of moderate flood, wetness and drought limitations depending upon the geology.

9. The Subgrade 3b (moderate quality) land that makes up 46% of the site has a combination of moderate gradient, wetness, drought, soil depth and stoniness limitations. The Grade 4 (poor quality), 29% of the site, land has severe gradient, soil depth and wetness limitations. On the higher ground the drainage of the shallow soil is variable and therefore these Subgrade 3b and Grade 4 mapping units are transitional.

CLIMATE

10. 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.

11. Since the ALC grade of land is determined by the most limiting factor present, overall climate is considered first. This is 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.

12. Climatic variables also affect ALC grade through interactions with soil conditions. The most important interactive variables are Field Capacity (FC) days and potential Moisture Deficits (MD) which are calculated for wheat and potatoes. The FC days are used in assessing soil wetness. The MDs are compared with the moisture available in each profile to assess soil droughtiness limitations. These are described in later sections. A potentially critical boundary

of 175/176 FC days was found. The boundary is at an altitude of approximately 60 m, although this varies slightly across the site. Numerous climatic interpolations were carried out to locate the boundary. MDs also varied across the site but these do not alter the actual grades of the mapping units.

Table 2: Climatic Interpolations: Keynsham

Grid Reference		ST 653 698	ST 673 656	ST 683 680
Altitude (m)		9	108	30
Accumulated Temperature (day °C)		1539	1427	1515
Average Annual Rainfall (mm)		780	807	774
Overall Climatic Grade		1	1	1
Field Capacity Days		175	178	174
Moisture deficit (mm):	Wheat	101	89	100
	Potatoes	93	76	91

RELIEF

13. Altitude ranges from nine metres at Keynsham Hams, to 108 metres in the South East corner of the site. The gradients within the survey area are mostly level, and gently and moderately sloping. There are some strongly, moderately steeply and steeply sloping gradients in Stockwood Vale and the Chew Valley. These will limit the ALC grades to Subgrade 3b and Grade 4.

14. The flood risk along the River Avon was assessed as being similar to that affecting the northern side, as surveyed in 1995 (ADAS 1995). This is a moderate flood limitation being, no worse than Subgrade 3a and possibly Grade 2.

GEOLOGY AND SOILS

15. The underlying geology of the site is shown on the published geology maps (IGS, 1974 1990). The area is predominantly underlain by Jurassic White and Blue Lias, mainly limestones. This particularly applies to the higher land. In the valleys Triassic Keuper Marl is mapped, fringed by clay and shale. Recent deposits of alluvium and Second Terrace Gravels are also found in the valley bottoms. Two areas of Jurassic Lower Lias clay are mapped to the north of Parkhouse Lane and in the Northeast of the site. The Northwest of the site is mapped as Carboniferous Coal Measures. The recent survey found limestone in all the plateau areas. Other deposits were found largely as indicated, except that the gravel deposits are not as widespread.

16. Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1:250 000 (SSEW 1983). This shows it as the Sherborne Association corresponding to the Jurassic Limestone and Worcester Association to the Keuper Marl. Soil over the Lower Lias clay in the East is mapped as the Evesham 2 with the Badsey 1 Associations nearer to the river. Along the River Avon the Fladbury 1 Association is mapped. A smaller area of the

Dale Association is mapped at Chewton Keynsham, and to the north of Hicks Gate the Neath Association is shown. More detailed soils information is also available for the eastern area of the site in the 1: 63 560 scale survey of the Malmesbury and Bath area (SSEW 1974). This shows a similar distribution of soil types to the smaller scale map.

17. Soil from the Sherborne Association is described as being shallow well-drained brashy calcareous clayey soils over limestone, associated with slowly permeable calcareous clayey soils. Worcester Association is a slowly permeable reddish clay over mudstone. Evesham 2 and Dale soils are also slowly permeable clays but the Evesham 2 soils are calcareous. The Badsey Association is described as a well-drained fine loamy soil over limestone gravel with some deeper soils over gravel. Fladbury 1 Association, a stoneless clayey soil variably affected by ground water, is found on flat land. The Neath Association is described as a well-drained fine loamy soil over rock. While small patches of similar soils have slowly permeable subsoils and slight seasonal waterlogging.

18. During the recent survey soil in the areas mapped as Sherborne Association was found to be shallow and often showed evidence of waterlogging particularly in the western part of the site. They are mainly clayey in the West but are lighter over the limestone in the East. The permeability of the red Worcester Association soils was variable with only some profiles having a slowly permeable layer. The other soils found during the recent survey were generally as described except for the Badsey Association which was not as widespread.

AGRICULTURAL LAND CLASSIFICATION

19. The distribution of ALC grades found by the current survey is shown on the accompanying 1:20 000 scale maps 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

20. The small area of Grade 2 land, mapped at Chewton Keynsham, has a minor workability limitation. The profiles typically consist of heavy clay loam topsoils over clay subsoils. Although the clay has a low porosity the moderately developed sub-angular blocky structure allows enough drainage for the horizon to be permeable. The profiles were assessed as Wetness Class I (see Appendix II). Pit 14 is an example of this mapping unit.

Subgrade 3a

21. There are four different mapping units within this grade. The Subgrade 3a land in Stockwood Vale has a variable moderate workability limitation. These profiles are developed over Keuper Marl. They tend to be reddish heavy clay loam topsoils and upper subsoils over reddish clay lower subsoils. There are common amounts of manganese present in the subsoil but because there were no pale ped faces the profiles are not gleyed. The subsoils were found to have good porosity and were assessed as Wetness Class I and Pit 17 is representative of this area.

22. There are also a few isolated profiles where the drainage is slower and a moderate or severe wetness limitation is present. It was not possible to map these small areas at this level of survey.

23. The area of land to the north west of the new Bristol ring-road consists of soils from the Neath Association developed over Carboniferous Upper Coal Measures (sandstone) and Pennant Measures (shale). This geology can lead to variable wet and stony soil profiles. The Subgrade 3a profiles were stony and in places impenetrable. Pit 18 is representative of this mapping unit and shows that they have a moderate drought limitation. They consist of well-drained sandy clay loams and medium sandy loams over fractured bedrock, and were assessed as Wetness Class I.

24. The land along the bank of the River Avon at Keynsham Hams, Broad Mead and Saltford Mead has a moderate limitation due to flood risk. Although the soil profiles are of Grades 1 and 2 quality the risk of frequent short term and occasional medium term winter flooding restricts the usage to cereals at best. Pits 3 and 16 were dug in these areas.

25. On the northern side of Stidham Farm there is a small deposit of river terrace gravels. The soil profiles here consist of well-drained clay horizons. They are however stony as shown by Pit 8 with 36%, 35% and 41% hard rock by volume in the topsoil, upper subsoil and lower subsoil respectively. This reduces the amount of available moisture in the profile and gives a moderate drought limitation.

Subgrade 3b

26. The Subgrade 3b mapped on the limestone plateaux has moderate drought, soil depth and topsoil stone limitations. The profiles are variable in their depth to the limestone bedrock but it is typically found at a depth of 25-30 cm. This will restrict the type of cultivations that can be undertaken as well as affecting the rooting of certain crops. Where the bedrock is well weathered at the surface and fractured there are high stone contents in the topsoil. This will limit the usage of the land due to the increased wear and tear on the implements. It is possible that because of the limitations of impenetrable auger borings some related areas of Grade 4 land with a wetness limitation may be included in these mapping units.

27. The large mapping unit of Subgrade 3b between Keynsham, Saltford and the River Avon has a moderate wetness limitation. In places where the limestone is found closer to the surface there is also a moderate drought limitation. The profiles typically show evidence of gleying in the subsoils which are also slowly permeable. Pit 4 is an example of this mapping unit and was assessed as Wetness Class IV with a moderate wetness limitation.

28. Around Hicks Gate the land has been mapped with a moderate wetness limitation. Soil profile pits 11 and 12 are typical of these profiles that are developed on the Keuper Marl. Soil profiles derived from Keuper Marl can have varying porosity. The profiles have clay topsoils over reddish clay subsoils. There is no evidence of gleying in the profiles although a few manganese concretions can be seen in the subsoils. The lower subsoils are slowly permeable layers and they were assessed as Wetness Class II.

29. Areas of sloping land between Whitchurch and Keynsham have been mapped as Subgrade 3b with a moderate gradient limitation. The land is strongly sloping with gradients of 8-11°. This will restrict the safe and accurate use of some agricultural machinery, thus restricting cropping practises.

Grade 4

30. The land mapped as Grade 4 on the limestone plateaux in the southern parts of the site has variable severe wetness and soil depth limitations. In places where the limestone bedrock is more fractured it is possible to find gleyed clay subsoils that are slowly permeable. These profiles were assessed as Wetness Class IV with a severe wetness limitation. This wetness is sporadic within the soil type and because of the limitations of impenetrable auger borings other similar areas may be included in the Subgrade 3b mapping units.

31. A small area of land in Charlton Bottom has a severe wetness limitation. Here the profiles typically consist of clay topsoils over reddish clay subsoils. The subsoils are slowly permeable and the profiles were assessed as Wetness Class 4.

32. In the valleys between Whitchurch and Keynsham, and in the Chew Valley the Grade 4 land has a severe limitation due to the gradient. The land is moderately steeply and steeply sloping with gradients between 12° and 18°.

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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 that 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 that can be grazed or harvested over most of the year.

Grade 4 - poor quality agricultural land

Land with severe limitations that significantly restrict the range of crops and/or level of yields. It is mainly suited to grass with occasional arable crops (e.g. 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 that 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 (Ed) (1997) Soil Survey Field Handbook. Soil Survey Technical Monograph No 5, SSLRC, Cranfield.

GRADING NOTE (36/97)

The previous surveys map Subgrades 3b and 3c over most of their area, with a small area of Subgrade 3a. Under the new guidelines Subgrades 3b and 3c are now usually found to be amalgamated. There was no evidence at this level of survey to suggest that there is any land of Subgrade 3a quality to the west of Eastover Farm.

The limitations from the two surveys show that the same soil types were found with droughty, shallow and wet profiles.

EDITING NOTE (36/97)

Due to the large number of consultants from different teams working on this job there are what may appear to be inaccuracies in the horizon database. Certain horizons are marked as gleyed without the requisite soil colours and ochreous mottles having been recorded. Some of these may be "carry-overs" but in other cases they are likely to be mistakes in the data entry where the surveyor wanted to record a gleyed horizon. It was not possible to reconcile these queries due to the length of time since the field work was completed.

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9/12/97

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, 1997).

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	**WA:** Weakly developed Adherent	**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%			

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, 1997) for details.