

**Alveston Hill, Stratford**  
**Agricultural Land Classification**  
**March 1998**

Resource Planning Team  
FRCA Worcester  
Western Region

Job Number 09/98

MAFF Ref: EL43/01528



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## **ALVESTON HILL - STRATFORD-UPON-AVON**

### **AGRICULTURAL LAND CLASSIFICATION SURVEY**

#### **INTRODUCTION**

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 94.6 ha of land at Alveston Hill, Stratford-upon-Avon. Field survey was based on 83 auger borings and 4 soil profile pits, and was completed in March 1998. During the survey 6 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 Stratford-upon-Avon 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 Grade 2 and Grade 3, with Grade 2 being found along the north and east of the site and grade 3 along the south and west of the site. The site was previously surveyed using original guidelines. 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. A survey (ADAS, 1994) was undertaken on an area of land adjacent to the present site, using the Revised Guidelines and Criteria for Grading the Quality of Agricultural Land (MAFF 1988). This survey at Alveston Hill shows Grade 2 and subgrade 3b land adjacent to the present site. Attention was paid to the grading of the land from this survey for the grading of land from the present survey.
5. At the time of survey land cover was arable and grassland. Other land which was not surveyed included woodland, agricultural buildings, roads, tracks and residential areas.

#### **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: Alveston Hill**

<b>Grade</b>	<b>Area (ha)</b>	<b>% Surveyed Area (94.6 ha)</b>
2	37.8	40.0
3a	37.2	39.0
3b	6.5	7.0
Other land	13.1	14.0
Total site area	94.6	100.0

7. Best and most versatile land occurs across the majority of the site with the exception of a band of Subgrade 3b land which runs east-west across the north of the site. Grade 2 land is found west of Alveston Hill Cottage and below the public footpath in the south; west of Alveston Hill Farm and in two isolated areas, one west of Arden Heath Farm, the other to the south-east of Chipping Court. These soils are limited by soil droughtiness on the lighter sandier profiles and by soil wetness on the slightly heavier clay loam over clay profiles. Subgrade 3a land is found in the central part of the site around Chipping Court with a further two areas, one to the east of Arden Heath Farm and the other in the extreme south of the site, again the heavier profiles are limited by soil wetness whilst the lighter soils are limited by soil droughtiness. Subgrade 3b land is found in the northern part of the site running east-west south of Arden Heath Farm. The profiles were extremely stony throughout and the soils are limited by soil droughtiness.

## **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: Alveston Hill**

Grid Reference	SP 223 546	SP 219 539	SP 220 538
Altitude (m)	46	55	64
Accumulated Temperature (day °C)	1446	1436	1426
Average Annual Rainfall (mm)	610	613	616
Overall Climatic Grade	1	1	1
Field Capacity Days	130	131	131
Moisture deficit (mm):			
Wheat	111	110	110
Potatoes	104	103	103

## **RELIEF**

11. Altitude ranges from 43 metres at the north-west corner of the site to 66 metres at Alveston Hill Cottage with gentle slopes which are not limiting to agricultural land use.

## **GEOLOGY AND SOILS**

12. The underlying geology of the site is shown on the published geology map (IGS, 1974) wholly as Keuper Marl largely overlain with deposits of river terrace gravels. In the southern, central eastern and north-western parts of the site where the Keuper Marl is not overlain with gravels, the clay is found higher in the soil profile. Sandier soils are found to correspond to the areas of river terrace gravels.
13. Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1:250 000 (SSEW, 1983) as Whimple 3 Soil Association across the southern end of the site as far north as the public footpath to the south of Alveston Hill Cottage. The remainder of the site is mapped as Wick 1 Association. More detailed soils information is also available in the 1:25,000 scale survey of Stratford-upon-Avon east area (SSEW, 1986).
14. The Whimple 3 Soil Association is described as having slightly stony clay loam or silty clay loam topsoil over clay loam or silty clay loam onto silty clay or clay at depth. The Whimple soils suffer slight seasonal waterlogging (Wetness Class III) but in the drier parts of the region the soils can have a better water regime (Wetness Class II). The Wick 1 Association is described as having slightly stony sandy loam or sandy silt loam topsoils over slightly or moderately stony loamy sand or sand to depth. The soils are permeable and well drained (Wetness Class I).
15. The majority of the soils in the present survey were found to closely follow the distribution described above; soils were lighter and better drained over the north and west of the site whilst the soils over the south and east of the site were slightly heavier.

## **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.

17. **Grade 2**

The main area of very good quality land is found across the central part of the site north and west of Alveston Hill Cottage and in the south of the site below the public footpath. Two isolated areas of Grade 2 land were also identified to the west of Arden Heath Farm and to the south-east of Chipping Court. The soils were described as having sandy loam or sandy clay loam topsoil textures overlying loamy sand, sandy loam or sandy clay loam subsoils, which passed onto either clay or sand to depth. Stones were present through the profile and the majority of soil profiles were droughty. Heavier profiles, where sandy clay loam is found over clay at depth, were found to have a slight wetness limitation which placed the soils in Wetness Class II (see Appendix II).

18. **Subgrade 3a**

The majority of good quality land is found over the central part of the site around Chipping Court although a further two areas of good quality land are found in the north-east of the site to the east of Arden Heath Farm and in the very south of the site north of Heath Farm. The soils were described as having clay loam, sandy clay loam or sandy loam topsoils over sandy clay loam or loamy sand subsoils, passing onto either clay or sand to depth. The heavier profiles of clay loam or sandy clay loam over clay were found to have a moderate wetness limitation which places the soils in Wetness Class III. The lighter profiles of sandy loam topsoils over loamy sand subsoils onto sand to depth were found to be limited by soil droughtiness.

19. **Subgrade 3b**

The moderate quality land is found running east-west south of Arden Heath Farm. The soils were described as having sandy loam topsoils over sandy clay loam or sand subsoils onto clay or sand to depth. The profiles were extremely stony throughout which resulted in a drought limitation.

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April 1998

## **REFERENCES**

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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 (Ed) (1997) Soil Survey Field Handbook. Soil Survey Technical Monograph No 5, Silsoe.

## 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

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

<b>MREL:</b>	Microrelief limitation	<b>FLOOD:</b>	Flood risk	<b>EROSN:</b>	Soil erosion risk
<b>EXP:</b>	Exposure limitation	<b>FROST:</b>	Frost prone	<b>DIST:</b>	Disturbed land
<b>CHEM:</b>	Chemical limitation				

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

<b>OC:</b>	Overall Climate	<b>AE:</b>	Aspect	<b>EX:</b>	Exposure
<b>FR:</b>	Frost Risk	<b>GR:</b>	Gradient	<b>MR:</b>	Microrelief
<b>FL:</b>	Flood Risk	<b>TX:</b>	Topsoil Texture	<b>DP:</b>	Soil Depth

<b>CH:</b> Chemical	<b>WE:</b> Wetness	<b>WK:</b> Workability
<b>DR:</b> Drought	<b>ER:</b> Erosion Risk	<b>WD:</b> Soil Wetness/Droughtiness
<b>ST:</b> Topsoil Stoniness		

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

<b>S:</b> Sand	<b>LS:</b> Loamy Sand	<b>SL:</b> Sandy Loam
<b>SZL:</b> Sandy Silt Loam	<b>CL:</b> Clay Loam	<b>ZCL:</b> Silty Clay Loam
<b>ZL:</b> Silt Loam	<b>SCL:</b> Sandy Clay Loam	<b>C:</b> Clay
<b>SC:</b> Sandy clay	<b>ZC:</b> Silty clay	<b>OL:</b> Organic Loam
<b>P:</b> Peat	<b>SP:</b> Sandy Peat	<b>LP:</b> Loamy Peat
<b>PL:</b> Peaty Loam	<b>PS:</b> Peaty Sand	<b>MZ:</b> 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:-

<b>F:</b> Fine (more than 66% of the sand less than 0.2mm)
<b>M:</b> Medium (less than 66% fine sand and less than 33% coarse sand)
<b>C:</b> 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

<b>F:</b> faint - indistinct mottles, evident only on close inspection
<b>D:</b> distinct - mottles are readily seen
<b>P:</b> 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.

<b>HR:</b> All hard rocks and stones	<b>SLST:</b> Soft oolitic or dolimitic limestone
<b>CH:</b> Chalk	<b>FSST:</b> Soft, fine grained sandstone
<b>ZR:</b> Soft, argillaceous, or silty rocks	<b>GH:</b> Gravel with non-porous (hard) stones
<b>MSST:</b> Soft, medium grained sandstone	<b>GS:</b> 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

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

**CONSIST:** Soil consistence is described using the following notation:

<b>L:</b> Loose	<b>VF:</b> Very Friable	<b>FR:</b> Friable	<b>FM:</b> Firm
<b>VM:</b> Very firm	<b>EM:</b> Extremely firm	<b>EH:</b> 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:

<b>VIS:</b> Visual	<b>S:</b> Sieve	<b>D:</b> Displacement
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**MOTTLE SIZE:**

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

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

**POROSITY:**

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

**ROOT ABUNDANCE:**

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

**ROOT SIZE**

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

**HORIZON BOUNDARY DISTINCTNESS:**

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

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

\* See Soil Survey Field Handbook (Hodgson, 1997) for details.

SITE NAME ALVESTON HILL	PROFILE NO. PIT1 (ASP 53)	SLOPE AND ASPECT LEVEL	LAND USE CEREALS	Av Rainfall: 613 mm ATO: 1436 day °C	PARENT MATERIAL KEUPER MARL
JOB NO. 9/98	DATE 5.3.98	GRID REFERENCE SP 224 538	DESCRIBED BY SK & SH	FC Days: 131 Climatic Grade: 1 Exposure Grade: -	PSD SAMPLES TAKEN TOPSOIL S-52%, Z-28%, C20% SCL UPPER SUBSOIL S-42%, Z-25%, C-33% HCL

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	31	SCL	75YR 4/3	1% > 2cm 3% total HR (vis)	none	-	-	-	-	-	CF & VF	-	Smooth Clear
2	48	HCL	75YR 4/4	5% total HR (vis) in band at top of horizon 2	none	none	MDCSAB	FM	M	good	FF & VF	-	Smooth Clear
3	100 augered to 120cm	C	05YR 4/4 (05YR4/3)	none	none	few on ped faces	MD/ST CPL* Breaking readily to MDCAB	FM	P	poor	FF & VF Horizontal along ped faces	-	

Profile Gleyed From: -  
Slowly Permeable Horizon From: 48cm  
Wetness Class: III  
Wetness Grade: 3a

Available Water Wheat: 129 mm  
Potatoes: 106 mm  
Moisture Deficit Wheat: 110 mm  
Potatoes: 103 mm  
Moisture Balance Wheat: +19 mm  
Potatoes: +3 mm  
Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 3a  
Main Limiting Factor(s): We

Remarks:  
\* Horizon 3 - coarse Platy structure is dominant

SITE NAME Alveston Hill		PROFILE NO Pit 2 (ASP 72)		SLOPE AND ASPECT 2° South		LAND USE Ley		Av Rainfall: 613 mm ATO: 1436 day °C		PARENT MATERIAL River Gravels 4th terrace			
JOB NO. 9/98		DATE 12.3.98		GRID REFERENCE SP 222 535		DESCRIBED BY SK & SH		FC Days: 131 Climatic Grade: 1 Exposure Grade: -		PSD SAMPLES TAKEN Topsoil S-66%, Z-22%, C-12%, MSL Upper subsoil S-65%, Z-21%, C-14%, MSL			
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.	29	MSL	75YR2/3	1%>2cm 11%<2cm 12% total HR (S&D)	None	-	-	-	-	-	CF&VF	-	Smooth clear
2.	40	MSL	75YR3/3-4/3	1%>2cm 3%<2cm 4% total HR (S&D)	None	-	MDCSAB	FR	G	good	CF & VF	-	Smooth gradual
3.	49	MSL	75YR3/4-4/4	1%>2cm 3%<2cm 4% total HR (S&D)	None	-	MDCSAB	FR	M	good	CF & VF	-	Smooth gradual
4.	55	MSL	75YR3/4-4/4	2%>2cm 14%<2cm 16% total HD (S&D)	None	-	MDCSAB	FR	M	good	CF & VF	-	Smooth clear
5.	88	MS	10YR4/6 75YR 4/6	10%<2cm HR (S&D)	None	-	WKMA B	VF	G	good	FVF	-	Wavy abrupt
6.	110	SCL	05YR4/4-4/6	21% < 2cm HR (S&D)	None	few	cemented	FR	M	good	-	-	Smooth clear

SITE NAME Alveston Hill		Pit 2 (ASP 72)	SLOPE AND ASPECT 2° South		LAND USE Ley	Av Rainfall: 613 mm ATO: 1436 day °C		PARENT MATERIAL River Gravels 4th terrace				
JOB NO. 9/98		12.3.98	SP 222 535		DESCRIBED BY SK & SH	FC Days: 131 Climatic Grade: 1 Exposure Grade: -		PSD SAMPLES TAKEN Topsoil S-66%,Z-22%, C-12%, MSL Upper subsoil S-65%, Z-21%, C-14%, MSL				

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
7.	120	MS	10YR5/6	-	-	-	-	VF	M	good	-	-	

Profile Gleyed From: -	Available Water	Wheat: 114mm	Final ALC Grade: 3a
Slowly Permeable Horizon From: -		Potatoes 90mm	
Wetness Class: I	Moisture Deficit	Wheat 110mm	Main Limiting Factor(s) DR
		Potatoes 103mm	
Wetness Grade: I	Moisture Balance	Wheat: +4mm	Remarks:
	Droughtiness Grade: 3a	Potatoes: -13mm (Calculated to 120 cm)	

SITE NAME Alveston Hill		PROFILE NO. Pit 3 (ASP42)		SLOPE AND ASPECT 2°North		LAND USE CER (barley)		Av Rainfall: 613mm ATO: 1436 day °C		PARENT MATERIAL River gravels 4th terrace			
JOB NO. 9/98		DATE 12.3.98		GRID REFERENCE SP221 539		DESCRIBED BY SK/SH		FC Days: 131 Climatic Grade: 1 Exposure Grade: -		PSD SAMPLES TAKEN Topsoil S-65%, Z-22%, C-13% MSL			
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	34	MSL	75YR4/3	1% > 2cm vis 7% < 1cm (S&D) 8% HR total	none	none	-	-	-	-	MF&VF	-	smooth clear
2	49	MSL	75YR4/3 4/4	2% > 2cm vis 10% < 1cm (S&D) 12% HR total *	none	none	WK M&C AB (very st)	VF	G	good	CF&VF	-	smooth clear
3	84	MS	10YR5/6+ 75YR4/4- 4/6	5% > 2cm 28% < 1cm (S&D) 33% HR total	Few 10YR5/6	common especially around stones and along root channels	WK MAB (very st)	VF	M	good	FVF	-	smooth clear
4	120	SCL/SC	05YR4/4	15% HR total	Common fine Distinct 75YR5/6	Many throughout along ped surfaces	MD C PLY	FM	P		FVF	-	

Profile Gleyed From: -  
Slowly Permeable Horizon From: -  
Wetness Class: I  
Wetness Grade: 1

Available Water  
Wheat: 111mm  
Potatoes 85mm  
Moisture Deficit  
Wheat 110mm  
Potatoes 103mm  
Moisture Balance  
Wheat: +1mm  
Droughtiness Grade:  
Potatoes -18mm  
:3a (Calculated to 120cm)

Final ALC Grade: 3a  
Main Limiting Factor(s) DR

Remarks:  
\*74-84cm  
42% stone s&d < 1cm

SITE NAME Alveston Hill		PROFILE NO. Pit 4 (ASP 14-15)		SLOPE AND ASPECT Level		LAND USE Ley		Av Rainfall: 613mm ATO: 1436 day °C		PARENT MATERIAL River gravels 4th terrace			
JOB NO. 9/98		DATE 12.3.98		GRID REFERENCE SP 2225 5435		DESCRIBED BY SK & SH		FC Days: 131 Climatic Grade: 1 Exposure Grade: -		PSD SAMPLES TAKEN Topsoil S-66%, Z-20%, C-14%, MSL			
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	MSL	10YR4/3	1% >2cm 21% (<1cm S&D) 22% HR total	-	-	-	-	-	-	MF & VFF	-	Smooth sharp
2.	48	MSL	10YR5/3	24%HR (S&D)	75YR4/6 common fine distinct	Fe band at top of horizon	WKCSAB	VF	M	good	F & VFF	-	Smooth gradual
3.	80	MS	10YR6/4	28%HR (S&D)	75YR4/6-5/6 common fine distinct	none	WKM&CSAB	VF	M	good	CF & VFF	-	Wavy clear
4	120	*MS	05YR5/5	49%HR (S&D)	none	many	-	FR	M	poor	VFF	-	

Profile Gleyed From: 30

Slowly Permeable Horizon From: -

Wetness Class: I

Wetness Grade: 1

Available Water Wheat: 80mm

Potatoes 71mm

Moisture Deficit Wheat 110mm

Potatoes 103mm

Moisture Balance Wheat: -30mm

Droughtiness Potatoes: -32mm  
Grade: 3b (Calculated to 120 cm)

Final ALC Grade: 3b

Main Limiting Factor(s) DR

Remarks:

\*cemented with Fe band at top of horizon 4