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Finstall Park, Bromsgrove
Agricultural Land Classification

June 1997

Resource Planning Team
Bristol
FRCA Western Region

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FINSTALL PARK, BROMSGROVE
AGRICULTURAL LAND CLASSIFICATION SURVEY

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FINSTALL PARK, BROMSGROVE

AGRICULTURAL LAND CLASSIFICATION SURVEY

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 180.2 ha of land around Finstall Park, on the southern side of Bromsgrove. Field survey was based on 132 auger borings and seven 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 being Grade 2 to the north of Tack Farm, Crossbrook Farm and Grimley Farm with Grade 3 land to the south, 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. Land around the old Wagon Works, near St Godwalds, was surveyed in 1994 (ADAS, 1994) using the Revised Guidelines and Criteria (MAFF, 1988). Attention was paid to the grading of this land during the current survey.
5. At the time of survey land cover was mainly permanent and ley grassland. There were also areas of maize and fodder crop cultivation. An area of 13 ha of agricultural land within the survey area, at Finstall, Grimley Hall and near St Godwalds, was not surveyed because of access restrictions. Other land which was not surveyed included woodland, sports fields, agricultural buildings 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.
7. An area of 80.1 ha of land was graded as 'best and most versatile', this being 72.4 % of the agricultural land surveyed. Of this nearly 30 % is Grade 1 (excellent quality) land, almost 20 % is Grade 2 (very good quality) land and nearly 25 % is Subgrade 3a (good quality) land. Most of the rest of the site was mapped as Subgrade 3b (moderate quality) land with just a small area of Grade 4 (poor quality) land mapped at Finstall.

Table 1: Distribution of ALC grades: Fininstall Park, Bromsgrove

Grade	Area (ha)	% Surveyed Area (138.3 ha)
1	40.5	29.3
2	25.5	18.4
3a	34.1	24.7
3b	23.2	16.8
4	2.0	1.4
Agricultural land not surveyed	13.0	9.4
Other land	41.9	-
Total site area	180.2	100

8. The Grade 1 land, mapped around Fininstall and Fininstall Park, has no or only very minor limitations to its agricultural use. These profiles are deep, sandy and well drained with no drought limitation.

9. The smaller Grade 2 mapping units have a combination of minor limitations; workability, wetness and drought, to their agricultural use. The textures are slightly heavier than those of the Grade 1 land with some slowly permeable red clay lower subsoils and a small area developed over gravel deposits.

10. The Subgrade 3a land, mapped in the southern part of the site, has moderate wetness limitations. The profiles have impaired drainage in their red clay subsoils as well as heavier topsoil textures.

11. The land mapped as Subgrade 3b has moderate wetness and gradient limitations to its agricultural use. There are slowly permeable red clay subsoils higher up the profiles which will impair the drainage of the land. Some small areas of land at Stoke Court and near Fininstall have a moderate limitation due to their gradient, 8-11°, which will restrict the type of machinery which can be safely and accurately used.

12. The small area of Grade 4 land near Fininstall has a severe limitation to its agricultural use due to its gradient, 12-18°, which will restrict the type of machinery which can be safely and accurately used.

CLIMATE

13. 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 on the next page.

14. 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.

Table 2: Climatic Interpolations: Finstall Park, Bromsgrove

Grid Reference	SO 960 681	SO 983 699	SO 980 696
Altitude (m)	70	135	100
Accumulated Temperature (day °C)	1419	1344	1384
Average Annual Rainfall (mm)	670	738	713
Overall Climatic Grade	1	1	1
Field Capacity Days	153	167	163
Moisture deficit (mm):			
Wheat	102	91	96
Potatoes	93	78	85

15. 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.

RELIEF

16. Altitude ranges from 70 metres at Stoke Pound to 135 metres near Finstall. Gradients within the site area are mainly level (0-1°), gently (2-3°) and moderately (4-7°) sloping. There are small areas of strongly (8-11°) sloping land at Stoke Court and near Finstall, where there is also some moderately steeply (12-15°) sloping land. The strongly and moderately steeply sloping land cause limitations to the agricultural use of the land.

GEOLOGY AND SOILS

17. The underlying geology of the site is shown on the published geology map (IGS, 1979) as being Permian and Triassic sandstones, including Bunter and Keuper sandstone, in the northern half of the site. In the southern half this changes to Triassic mudstones, including Keuper Marl, Dolomitic conglomerate and Rhaetic. The type of soils which are expected to develop over this geology were found during the current survey and weathered sandstone was also found at the bottom of some profiles.

18. Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1:250 000 (SSEW, 1983) as being from the Bromsgrove Association. Soils from the Whimple 3 Association are mapped along the southern edge of the site.

19. Bromsgrove soils are described as being well drained reddish coarse loamy soils over soft sandstone which may be deep in places. They are associated with fine loamy soils over slowly permeable subsoils which experience slight seasonal waterlogging. The Whimple 3

Association is described as being reddish fine loamy, or fine silty over clayey soils, with slowly permeable subsoils and slight seasonal waterlogging. Some similar clayey soils are found on brows while slowly permeable seasonally waterlogged fine loamy and fine silty over clayey soils are found on lower slopes.

20. The soils found to the south of Fininstall Park are similar to those of the Bromsgrove Association with a variable distribution of drainage characteristics. To the north of the park the soil were sandier as might be expected with the sandstone geology. There are some slowly permeable subsoils which were found near Stoke Court but it is difficult to tell whether they are from the Bromsgrove or Whimple 3 Associations.

AGRICULTURAL LAND CLASSIFICATION

21. 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

22. The Grade 1 land which is mapped at Fininstall and Fininstall Park has no, or only minor, limitations to its agricultural use. The profiles are, mainly, deep and well drained with no drought limitation. These soils have developed over the weathered sandstones and have medium clay loam and medium sandy loam topsoils over clay loam, sandy clay loam and loamy sand subsoils. They were assessed as Wetness Class I (see Appendix 2).

Grade 2

23. Within these mapping units there are three types of profile. The land on Lower Gambolds Lane is subject to a minor wetness limitation which will affect yield, cultivations and harvesting. These profiles typically have medium clay loam topsoils over sandy clay loam and heavy clay loam upper subsoils, and reddish clay lower subsoils of varying permeability. There are also some profiles which have gleyed upper subsoils over a slowly permeable layers at depth. The profiles were assessed as Wetness Class II.

24. The Grade 2 mapping unit near Crossbrook Farm has minor workability and drought limitations. There is also some variability in its grading with a few Grade 1 profiles being included in the mapping unit. The profiles were all well drained and were assessed as Wetness Class I. Typically there are heavy clay loam topsoils over porous heavy clay loam, sandy clay loam and clay subsoils. The heavy topsoil texture reduces the amount of time that the land is in a workable condition. Occasionally where the topsoil texture was lighter the profiles were Grade 1. There was also a small area of impenetrable borings where the profile went into a gravel horizon. These profiles have a minor drought limitation where because of the light textures and increased stone contents the amount of available moisture in the profile is reduced and the soils are not able to meet the potential crop moisture requirements throughout the year.

Subgrade 3a

25. The land mapped as Subgrade 3a tends to have a moderate wetness limitation. This will restrict moderate or high yields to a narrow band of crops. There are two types of profile within the mapping unit. Both have slowly permeable reddish subsoils but only one type is gleyed. The gleying occurs above 40 cm and the profiles were assessed as Wetness Class III. Pit 1 is an example of this type of profile. They have medium clay loam topsoils.

26. The second type of profile has heavy clay loam topsoils but is not gleyed, and is shown by Pit 2. The slowly permeable reddish clay subsoil is found lower down the profile, below 57 cm, and they were assessed as Wetness Class II.

Subgrade 3b

26. Most of the land mapped as Subgrade 3b has a moderate wetness limitation. This will reduce yields to moderate or low levels depending on the crop as well as affecting the timing and type of cultivation and harvesting. These profiles have medium and heavy clay loam topsoils over red clay subsoils. These subsoils are slowly permeable, starting above 60 cm and continuing to below 100 cm, so the profiles were assessed as Wetness Class IV.

27. A few profiles which are not developed over the red marl are gleyed above 40 cm and have slowly permeable clay subsoils starting above 44 cm. These were also assessed as Wetness Class IV.

28. Land mapped as Subgrade 3b near Stoke Court and Fininstall has a moderate limitation to its agricultural use due to its gradient. The gradients found during the survey of 8-11° will restrict the safe and accurate use of some agricultural machinery, thus restricting cropping practises.

Grade 4

29. The Grade 4 land near Fininstall has a severe limitation due to its gradient. The gradients range from 12-18° and will severely restrict the type of machinery which can be safely and accurately used.

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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 (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 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	Av Rainfall: 713 mm	PARENT MATERIAL
Fininstall Park, Bromsgrove		Pit 1 (ASP 129)	3° South East	PGR	ATO: 1384 day °C	Bunter and Keuper Sandstone
JOB NO.		DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 163	PSD SAMPLES TAKEN
30/97		2/5/97	SO 974 689	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	33	MCL	7.5YR42	None	None	None	-	-	-	-	MVF	-	Abrupt wavy
2	58	MCL	7.5YR53 5YR43 (5YR63)	<1% HR	CDFO 7.5YR56	Common	MVCSAB breaking in MCSAB	Firm	Moderate	Poor	MVF	-	Gradual wavy
3	90+	HZCL with some MCL	2.5YR33 (5YR53) but also H2 colours	None	As H2 where lighter material	Common	Red material MVCAB (other MVCSAB)	Firm	Poor	Poor	CVF between peds	-	-

Profile Gleyed From: 33 cm	Available Water	Wheat: 132 mm	Final ALC Grade: 3a
Depth to Slowly Permeable Horizon: 67 cm (red material)		Potatoes: 114 mm	Main Limiting Factor(s): Wetness
Wetness Class: III	Moisture Deficit	Wheat: 96 mm	
Wetness Grade: 3a		Potatoes: 85 mm	
	Moisture Balance	Wheat: 36 mm	
		Potatoes: 29 mm	
	Droughtiness Grade: 1	(Calculated to 120 cm)	Remarks: H3 comprises mixed layers of material probabl laid down in bands hence lighter soils below red clays hence variability of auger borings. Only dark red material is SPL.

SITE NAME		PROFILE NO.	SLOPE AND ASPECT	LAND USE	Av Rainfall: 713 mm	PARENT MATERIAL
Fininstall Park, Bromsgrove		Pit 2 (ASP 178)	2° North West	Maize	ATO: 1384 day °C	
JOB NO.		DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 163	PSD SAMPLES TAKEN
30/97		20/5/97	SO 963 683	HLJ/PRW	Climatic Grade: 1	
					Exposure Grade: -	

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	7.5YR42	<1% HR (VIS)	None	None	-	-	-	Good	CF+VF	-	Abrupt smooth
2	64	C	7.5YR54	< 1% (VIS)	FDFO (7.5YR56)	None	MCSAB	Friable	Moderate	Good	CV+VF* ¹	-	Clear smooth
3	100+	C	0.5YR 43/44 * ² 7.5YR54/53 2.5Y53	5% MSST (VIS)	None	Common (at top)	WCSAB	Firm	Moderate	Poor	FF+VF	-	-

Profile Gleyed From: Not gleyed

Depth to Slowly Permeable Horizon: 64 cm

Wetness Class: II

Wetness Grade: 3a

Available Water Wheat: 139 mm

Potatoes: 117 mm

Moisture Deficit Wheat: 96 mm

Potatoes: 85 mm

Moisture Balance Wheat: 43 mm

Potatoes: 32 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Wetness

Remarks: *¹ mainly in worm channels
*² red is the dominant colour

SITE NAME Fininstall Park, Bromsgrove		PROFILE NO. Pit 3 (centre of ASPs 171, 178, 179)		SLOPE AND ASPECT 4° North		LAND USE Permanent Grass		Av Rainfall: 713 mm ATO: 1384 day °C FC Days: 163 Climatic Grade: 1 Exposure Grade: 1		PARENT MATERIAL Bunter and Keuper Sandstone			
JOB NO. 30/97		DATE 20/5/97		GRID REFERENCE SO 964 683		DESCRIBED BY PRW/HLJ				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	22	HCL	7.5YR43	<1% VIS	-	-	-	-	Moderate	Good	FF	-	Abrupt smooth
2	40	C	7.5YR44 (75YR52)	3% weathering sandstone (VIS)	CDOM 75YR56	Few	WCSAB	Friable	Moderate	Poor	FF	-	Clear wavy
3	65 augered to 100	C	5YR34 Some 25Y52	1% weathering sandstone (VIS)	-	-	WCSAB	Friable	Moderate	Poor	-	-	-

Profile Gleyed From: 22 cm (Pale ped faces) Depth to Slowly Permeable Horizon: 22 cm Wetness Class: 4 Wetness Grade: 3b	Available Water Wheat: 139 mm Potatoes: 115 mm	Final ALC Grade: 3b Main Limiting Factor(s): Wetness
	Moisture Deficit Wheat: 96 mm Potatoes: 85 mm	
	Moisture Balance Wheat: 43 mm Potatoes: 30 mm	Remarks: Moisture coming in at bottom
	Droughtiness Grade: 1 (Calculated to 120 cm)	

SITE NAME		PROFILE NO.	SLOPE AND ASPECT	LAND USE	Av Rainfall: 713 mm	PARENT MATERIAL
Fininstall Park, Bromsgrove		Pit 4 (ASP 145)	1° North West	Permanent Grass	ATO: 1384 day °C	Bunter and Keuper Sandstone
JOB NO.		DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 163	PSD SAMPLES TAKEN
30/97		20/5/97	SO 968 687	HLJ/PRW	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	27	MCL	75HR42	<1% HR (VIS)	None	None	-	-	-	Good	MF+VF	-	Abrupt smooth
2	85	SCL	75YR52/43	5% HR (VIS)	CDFO (75YR66)	Common* ¹	M/WCSAB	Friable	Moderate	Good	CF+VF	-	Abrupt smooth
3	100 * ²	C	05YR44	1% MSST (VIS)	None	Common	-	-	Poor (assumed)	Poor	FF+VF	-	-

Profile Gleyed From: 27 cm	Available Water	Wheat: 139 mm	Final ALC Grade: 2
Depth to Slowly Permeable Horizon: 85 cm		Potatoes: 110 mm	Main Limiting Factor(s): Wetness
Wetness Class: II	Moisture Deficit	Wheat: 96 mm	
Wetness Grade: 2		Potatoes: 85 mm	
	Moisture Balance	Wheat: 43 mm	
		Potatoes: 25 mm	Remarks: * ¹ in patches * ² augered to 100 cm
	Droughtiness Grade: 1	(Calculated to 120 cm)	

SITE NAME Fininstall Park, Bromsgrove		PROFILE NO. Pit 5 (ASP 97)	SLOPE AND ASPECT Flat	LAND USE Permanent Grass	Av Rainfall: 713 mm ATO: 1384 day °C	PARENT MATERIAL Bunter and Keuper Sandstone
JOB NO. 30/97		DATE 21/5/97	GRID REFERENCE SO 973 692	DESCRIBED BY HLJ/PRW	FC Days: 163 Climatic Grade: 1 Exposure Grade: 1	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	17	HCL	75YR32	<1%HR (VIS)	None	None	-	-	-	Good	MF+VF	-	Clear wavy
2	30	C	75YR53/54	0% (VIS)	None	Few	MCP _r	Friable	Moderate	Good* ¹	CF+VF	-	Clear smooth
3* ⁵	54	C	05YR44 (75YR53) 25Y63	0% (VIS)	CDFO* ² (25YR46)	Common* ³	MVPC _r breaking to WCPL* ⁴	Firm	Poor	Poor	CF+VF	-	Clear smooth
4	90+	C	25Y63	0% (VIS)	None	Few	WCSAB* ⁶	Very firm	Moderate	Poor	FF+VF	-	-

Profile Gleyed From: 30 cm (only just)	Available Water	Wheat: 133 mm	Final ALC Grade: 3b
Depth to Slowly Permeable Horizon: 30 cm		Potatoes: 108 mm	Main Limiting Factor(s): Wetness
Wetness Class: IV	Moisture Deficit	Wheat: 96 mm	
Wetness Grade: 3b		Potatoes: 85 mm	
	Moisture Balance	Wheat: 37 mm	
		Potatoes: 23 mm	
	Droughtiness Grade: 1	(Calculated to 120 cm)	Remarks: * ¹ borderline * ² * ³ in patches therefore only just gleyed * ⁴ almost a bedding structure * ⁵ 5 cm band of 't' green marl at bottom of H3 with MCAB and CDFO within peds; poor porosity * ⁶ tending to massive

SITE NAME		PROFILE NO.	SLOPE AND ASPECT	LAND USE	Av Rainfall: 713 mm	PARENT MATERIAL
Fininstall Park, Bromsgrove		Pit 6 (ASP 57)	2° South	Permanent Grass	ATO: 1386 day °C	
JOB NO.		DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 163	PSD SAMPLES TAKEN
30/97		22/5/97	SO 976 695	HLJ/PRW	Climatic Grade: 1	
					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	21	MSL	75YR43	<1% HR (VIS)	None	None	-	-	-	Good	MF+VF	-	Clear smooth
2	54	SCL	05YR43,44	<1% HR (VIS)	None	None	MVCP breaking to MCSAB	Friable	Moderate (poor)	Good	MF+VF (throughout)	-	Gradual smooth
3	77	SCL* ²	05YR44,54 (75YR64)	2% HR + MSST (VIS)	None* ¹	None	MCSAB* ³	Friable	Moderate	Poor* ⁴	CF+VF (throughout)	-	Clear smooth
4	95	LMS	05YR44	40% MSST (VIS) (weathering)	None	None	MCPL (layers in between weathering stone)	Friable	Moderate	Poor * ⁵	-	-	-

Profile Gleyed From: Not gleyed

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: I

Wetness Grade: 1

Available Water Wheat: 121 mm
Potatoes: 109 mm

Moisture Deficit Wheat: 96 mm
Potatoes: 85 mm

Moisture Balance Wheat: 25 mm
Potatoes: 24 mm

Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 1/2 (Grade 1 map unit)

Main Limiting Factor(s): Drought

Remarks: Worst case scenario is that SPL goes from 54-77 which is still borderline WC II/III WG1/2
*¹ some ochreous colours from weathering sandstone
*² light end of SCL
*³ some WCSAB
*⁴ and *⁵ but good drainage
Because of light texture in H3, the texture (and to some extent structure) is determining the drainage not the actual porosity

SITE NAME		PROFILE NO.	SLOPE AND ASPECT	LAND USE	Av Rainfall: 713 mm	PARENT MATERIAL
Fininstall Park, Bromsgrove		Pit 7 (ASP 34)	2° South	Permanent Grass	ATO: 1384 day °C	Bunter and Keuper sandstone
JOB NO.		DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 163	PSD SAMPLES TAKEN
30/97		23/5/97	SO 979 697	HLJ	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	32	MCL	75YR43	<1% HR (VIS)	None	None	-	-	-	-	MF+VF	-	Clear smooth
2	64	MCL	75YR54	<1% HR (VIS)	None	None	MCSAB	Friable	Moderate	Good	CF+VF	-	Clear smooth
3	120	SCL* ¹	05YR54,63	0% (VIS)	None	None	MCSAB (darker material)	Firm	Moderate	Good	FF+VF	-	-

Profile Gleyed From: Not gleyed

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: I

Wetness Grade: 1

Available Water Wheat: 156 mm

Potatoes: 118 mm

Moisture Deficit Wheat: 96 mm

Potatoes: 85 mm

Moisture Balance Wheat: 60 mm

Potatoes: 33 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 1

Main Limiting Factor(s):

Remarks: *¹ red clay mixed with lighter material

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.

GLEYS, 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

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.