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Town Farm, Burlescombe

Agricultural Land Classification and Site Physical Characteristics

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Resource Planning Team
Taunton Statutory Group
ADAS Bristol

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TOWN FARM, BURLESCOMBE

AGRICULTURAL LAND CLASSIFICATION SURVEY AND STATEMENT OF SITE PHYSICAL CHARACTERISTICS

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AGRICULTURAL LAND CLASSIFICATION AND SITE PHYSICAL CHARACTERISTICS

SUMMARY

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 18.7 ha of land at Town Farm, Burlescombe. Field survey was based on 13 auger borings and 3 soil profile Pits, and was completed in January 1997. This report also draws on the findings of the report of ALC Survey conducted by Land and Mineral Resource Consultants Ltd contained in their report dated January 1995. It was hoped that this survey would validate the consultants' report but consideration of the consultants' record of soil observations showed that additional information, particularly in relation to wetness and stone content, was required for ALC grading.

2. The survey was conducted by the Resource Planning Team of ADAS Taunton Statutory Group on behalf of MAFF Land Use Planning Unit in its statutory role in connection with an application to the Minerals Planning Authority under the Town and Country Planning Act, 1990 for sand and gravel extraction. Restoration proposals available for consideration are contained in ARC drawing W107K/48 and accompanying text.

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 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. Although not adjacent to the current site, a recent survey (ADAS 1994) of land on similar deposits near Hillhead Quarry near Waterloo Cross shows mainly ALC Grade 2 and Subgrade 3a.

5. At the time of survey land cover was maize and grass.

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: Town Farm, Burlescombe

Grade	Area (ha)	% Surveyed Area (18.7 ha)
2	8.9	47
3a	6.5	35
3b	3.3	18
Total site area	18.7	

6. This shows that 82% of the survey area was found to be best and most versatile, the area shown as Grade 2 having minor limitations, mainly due to droughtiness and the area shown as Subgrade 3a being more variable, including some with a moderate wetness limitation, small areas with a moderate droughtiness limitation and also including some observations shown to be Grade 2. The area shown as Subgrade 3b has a more serious moderate limitation due to gradient, comprising mainly short areas of steeper slopes within the fields where gradients were found to be just over 7°.

7. The site has been divided into three distinct areas, shown as Soil Units on the attached map of soil resources. This is not a soil stripping map but is intended to illustrate the soil resources available for restoration. Topsoil and Subsoil volumes for each Soil Unit are shown in Table 2.

Table 2: Soil Resources: Town Farm, Burlescombe

Map Unit	Depth, cm	Area, ha	Texture	Stones %	Volume, m^3
Topsoil					
I	0-25	4.6	MSL	35	11 500
II	0-25	11.6	MSL	25	29 000
III	0-25	2.5	MSL	2	6 250
				Total Topsoil	46 750 m^3
Subsoil					
I	25-55	4.6	HCL	50	13 500
	55-120	4.6	SC	25	29 900
II	25-70	11.6	HCL	25	52 200
	70-120	11.6	SC/MSL	25	58 000
III	20-40	2.5	HCL	5	5000
	40-120	2.5	C	5	20 000
				Total Subsoil	178 900 m^3

8. Depths and volumes quoted should be treated with caution due to soil variability. Soil resources may extend below 120 cm.

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INTRODUCTION

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4. Although not adjacent to the current site, a recent survey (ADAS 1994) of land on similar deposits near Hillhead Quarry near Waterloo Cross shows mainly ALC Grade 2 and Subgrade 3a.

5. At the time of survey land cover was maize and grass.

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.

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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 overall climatic limitation which limits part of the land to Grade 2.

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 200 FC Days was found more or less to coincide with the Grade 2 climatic boundary on the highest part of the site. However, this would only have been used in relation to Table 13 of the Revised Guidelines and was not required for grading on this site.

Table 2: Climatic Interpolations: Town Farm, Burlescombe

Grid Reference		ST 079166	ST 079170
Altitude (m)		160	122
Accumulated Temperature (day °C)		1403	1446
Average Annual Rainfall (mm)		992	965
Overall Climatic Grade		2	1
Field Capacity Days		200	197
Moisture deficit (mm):	Wheat	83	88
	Potatoes	69	76

10. Although not found to be the primary limitation at any point, the highest and most exposed parts of the site were considered to have a minor limitation due to exposure, being very exposed to the north.

RELIEF

11. Altitude ranges from 122 metres at the north end of the site to 165 metres by the reservoir at the top of the hill, with mixed slopes mainly with a northerly aspect. Although most of the site was found to be moderately sloping, with no limitation to ALC Grade, short lengths of strong slopes, mainly around 8°, were found to be scattered around the site and these are shown as Subgrade 3b on the ALC map.

GEOLOGY AND SOILS

12. The underlying geology of the site is shown on the published geology map (IGS, 1976) as mainly pebble beds and conglomerate. The stone content of the conglomerate was found to be highest in the central area of the site, shown on the Soil Resources map as Soil Unit 1, with lowest stone contents in the area shown as Soil Unit 3, where stone-free beds of red marl were found, acting as a slowly permeable layer.

13. Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1:250 000 (SSEW, 1983) as mainly Crediton Association. However, more detailed soils information is also available in the 1:25 000 scale survey of Soils of the Culm Valley (SSEW, 1987) which shows the site as mainly Bromsgrove Series, stony phase. This is described as deep permeable reddish light loams, passing to soft pebbly sandstone or sand at depth, locally very pebbly. The current survey found this description most appropriate to Soil Units 1 and 2.

AGRICULTURAL LAND CLASSIFICATION

14. 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

15. The area shown as Grade 2 was found to be Wetness Class I (see Appendix II) with minor limitations, mainly due to droughtiness and workability. Topsoil textures were found to be mainly medium sandy loam, with some sandy clay loam and Pit 2 was sited to represent the steepest and most stony parts of the mapping unit. Despite this the droughtiness calculation based on stone contents assessed by sieving and displacement showed a moisture balance at the better end of Grade 2, not far short of Grade 1. Other profiles within the mapping unit were shown to have considerably lower stone contents, but some of these were found to have sandy clay loam topsoil texture, indicating a minor limitation in workability.

Subgrade 3a

16. The area shown as Subgrade 3a is somewhat variable, containing observations with moderate limitations due to wetness and droughtiness, but also some profiles which would be classified as Grade 2, limited only by the overall climatic limitation. Profiles limited by wetness are found mainly at the lower and eastern end of the mapping unit and are illustrated by Pit 3, found to be Wetness Class III with a slowly permeable horizon at 68 cm and medium sandy loam topsoil texture. Pit 1 was sited in what was apparently the most stony part of the site, on the crest of the slope and although found to be Subgrade 3a on droughtiness, the stone content, which was also determined by sieving and displacement, was found even then to be very close to Grade 2.

Subgrade 3b

17. Areas of short slopes measured at over 7° are shown as Subgrade 3b. These slopes are short and were generally found to be only around 8° and have therefore been shown as isolated areas of lower grade land, rather than limiting the field as a whole.

SOIL RESOURCES

18. The site has been divided into three distinct areas, shown as Soil Units on the attached map of soil resources. This is not a soil stripping map but is intended to illustrate the soil resources available for restoration.

Soil Unit I

19. This unit extends to 4.6 ha and includes the most stony topsoils on the site. These were found to be around 23 cm deep, mainly medium sandy loam and a reddish brown, typically 5YR43 or 44. Consistency was friable with weakly developed fine subangular blocky structure. See Pit 1. Stone content in the topsoil was assessed by sieving and displacement at 35% hard rock, mainly gravel less than 2cm.

20. The upper subsoil was found to be slightly heavier, sandly clay loam or heavy clay loam 5YR44 becoming paler to 5YR54 and very stony around 53% hard rock as gravel and medium stones. Structure at Pit 1 was weakly developed fine subangular blocky, becoming firm but with good porosity.

21. Most observations in this area were impenetrable to the auger, but at Pit 1 the subsoil gradually became less stony between 50 and 60 cm to 28% hard rock as above. Texture was a variable but somewhat sandy clay, 2.5YR46. This was a firm weakly developed coarse subangular blocky with porosity greater than 0.5 mm just exceeding 0.5%.

Soil Unit II

22. This is the main unit on this site, extending to 11.6 ha and includes the least stony topsoils, mainly Wetness Class I with no slowly permeable layer.

23. Deep red brown topsoils, 5YR43 found to be generally medium sandy loam or sandy clay loam. Stone content was observed to be slight to moderate, assessed at Pit 2 as 26% hard rock, mainly small stones less than 2cm. Topsoil was friable, weakly developed fine subangular blocky.

24. Subsoil textures were variable, but the upper subsoil generally was heavier than the topsoil, typically heavy clay loam, although with considerable sand content. This upper subsoil was a deep reddish brown, 2.5YR34, friable and weakly developed medium subangular blocky. Porosity was good and stone content was assessed at 28% gravel and medium stones.

25. The lower subsoil was found to be a reddish sandy clay or clay but this was variable and at Pit 2 was found to be medium sandy loam or even loamy medium sand below 80cm. Porosity at Pit 2 was found to be low, only just exceeding 0.5% and a weakly developed coarse subangular blocky structure in the clay became more or less massive in the more sandy pockets. Stone contents in the lower subsoil were assessed at 25-41% as above. Typically, as at Pit 2, there is no evidence of wetness, as mottling or pale colours throughout the profile.

Soil Unit III

26. This unit is taken to include those observations showing a moderate wetness limitation due to clay slowly permeable layer, although not all observations within the unit were similar.

27. Topsoils were found to be typically medium sandy loam or medium clay loam, 5YR43 and very slightly stony. Consistency was friable with moderately developed medium and fine subangular blocky structure at Pit 3.

28. The upper subsoil was typically a heavy clay loam, 5YR44 to around 41cm, still very slightly stony and friable but moderately developed coarse subangular blocky with good porosity.

29. The lower subsoil was found to be a reddish clay, 2.5YR46, very slightly stony and firm. To around 68 cm this was found to be a moderately developed coarse prismatic structure with good porosity particularly macro pores due to earthworms. This soil horizon may be gleyed with common distinct medium ochreous mottles but at Pit 3, pale ped faces were not evident Porosity and structure in this clay gradually deteriorate so that around 68 cm it becomes gleyed with many distinct medium ochreous mottles and common manganese concretions with poor porosity and massive structure. This is a slowly permeable layer.

30. The depth to slowly permeable layer at Pit 3 indicates Wetness Class III, but this can be variable and where a slowly permeable layer occurs below around 72 cm this would be Wetness Class II but still Subgrade 3a with medium clay loam topsoil.

Table 3: Soil Resources: Town Farm, Burlescombe

Map Unit	Depth, cm	Area, ha	Texture	Stones %	Volume, m^3
Topsoil					
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II	0-25	11.6	MSL	25	29 000
III	0-25	2.5	MSL	2	6 250
				Total Topsoil	46 750 m^3
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	40-120	2.5	C	5	20 000
				Total Subsoil	178 900 m^3

31. Depths and volumes quoted should be treated with caution due to soil variability. Soil resources may extend below 120 cm, particularly in Units I and II.

RESTORATION

32. Restoration conditions should aim to alleviate the gradient limitation and leave a soil profile equivalent to Grade 2.

33. The gradient limitation can be alleviated by reprofiling the site to include a steeper bank, possibly woodland, as indicated in the ARC Restoration proposals. The width of this steeper bank, a loss to agriculture, depends on the net amount of material removed from the site, after allowing for any inert landfill.

34. The current restoration proposals are not adequate as contrary to Paragraph 11.2 in the text, drawing W107K/48 clearly show gradients of 1 in 5 within the site. This is just over 11°, equivalent to Grade 4 and extends over much of the central parcel.

35. The proposed pond does not have a perennial supply and has no fixed overflow control Therefore the water level will fluctuate with rainfall etc, causing unsightly conditions and a liability for the control of grazing stock. It also aggravates the grading of the site. There should be no depression: the restored site should rise continuously from the north corner, where there would be no steep bank and no need for shrub and tree planting. However, the minimum area of steep bank and associated woodland at the south of the site would need to shift towards the west compared to the situation shown on the restoration plan.

36. The Grade 2 criteria for droughtiness can be achieved with a typical profile described in Table 3 to a depth of 120 cm for Unit 1, 90 cm for Unit 2 and 65 cm for Unit 3. However, any soil forming material remaining below the restored profile may contribute to available water in the profile, but this can only be assessed when the composition of the proposed soil forming material is known.

37. The restoration proposals specify ripping using a single plain tine to a depth of 0.75 m at 2 m centres. Under the best conditions this is unlikely to achieve extensive loosening and under wet conditions is likely to amount to square moling with minimal heave. The specification should be to achieve loose conditions throughout the restored profile, so that the method of working can be varied to suit prevailing soil conditions, and equipment available, and the results can be judged against the target.

38. Perhaps the most important important objective in restoration should be to avoid the creation of a compacted or slowly permeable layer. The majority of soils on the site, as illustrated by Pits 1 and 2 have weakly developed structure which will deteriorate on movement and storage. The particle size distribution of these soils also predisposes them to compaction and a compacted surface, effecively a slowly permeable layer, will be created unless each layer is loosened before the next is added. Unless this is acheived, a slowly permeable compacted layer in the upper subsoil will reduce the site to Subgrade 3b.

39. The southern proposed hedge is hardly worthwhile as it creates a parcel of only 2.4 ha.

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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 (In preparation) Soil Survey Field Handbook, Revised Edition.

APPENDIX III

ABBREVIATIONS AND TERMS USED IN SURVEY DATA

Soil Pit and auger boring information collected during ALC survey is held on a computer database and is reproduced in this report. Terms used and abbreviations are set out below. These conform to definitions contained in the Soil Survey Field Handbook (Hodgson, 1974).

1. Terms used on computer database, in order of occurrence.

GRID REF: National 100 km grid square and 8 figure grid reference.

LAND USE: At the time of survey

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

GRDNT: Gradient as estimated or measured by hand-held optical clinometer.

GLEY, SPL: Depth in centimetres to gleying or slowly permeable layer.

AP (WHEAT/POTS): Crop-adjusted available water capacity.

MB (WHEAT/POTS): Moisture Balance. (Crop adjusted AP - crop potential MD)

DRT: Best grade according to soil droughtiness.

If any of the following factors are considered significant, 'Y' will be entered in the relevant column.

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

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

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

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

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

S:	Sand	**LS:**	Loamy Sand	**SL:**	Sandy Loam
SZL:	Sandy Silt Loam	**CL:**	Clay Loam	**ZCL**	Silty Clay Loam
ZL:	Silt Loam	**SCL:**	Sandy Clay Loam	**C:**	Clay
SC:	Sandy clay	**ZC:**	Silty clay	**OL:**	Organic Loam
P:	Peat	**SP:**	Sandy Peat	**LP:**	Loamy Peat
PL:	Peaty Loam	**PS:**	Peaty Sand	**MZ:**	Marine Light Silts

For the sand, loamy sand, sandy loam and sandy silt loam classes, the predominant size of sand fraction will be indicated by the use of the following prefixes:-

F: Fine (more than 66% of the sand less than 0.2mm)
M: Medium (less than 66% fine sand and less than 33% coarse sand)
C: Coarse (more than 33% of the sand larger than 0.6mm)

The clay loam and silty clay loam classes will be sub-divided according to the clay content: **M:** Medium (< 27% clay) **H:** heavy (27 - 35% clay)

MOTTLE COL: Mottle colour using Munsell notation.

MOTTLE ABUN: Mottle abundance, expressed as a percentage of the matrix or surface described.

F: few <2% **C:** common 2 - 20% **M:** many 20 - 40% **VM:** very many 40%+

MOTTLE CONT: Mottle contrast

F: faint - indistinct mottles, evident only on close inspection
D: distinct - mottles are readily seen
P: Prominent - mottling is conspicuous and one of the outstanding features of the horizon.

PED. COL: Ped face colour using Munsell notation.

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.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Town Farm, Burlescombe	Pit 1	4°N	Maize	Av Rainfall: 987 mm ATO: 1412 day °C	Pebble Beds
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 200 Climatic Grade: 2 Exposure Grade: 2	PSD SAMPLES TAKEN
9/97	17.1.97	ST 0790 1669	PB		TS 0-25 cm MSL (S58: Z27: C15%)

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	23	MSL	5YR43	4% > 2cm 31% < 2cm 35% HR (S+D)	0	0	WFSAB	Fr	-	G	CF, VF	-	Clear smooth
2	41	HCL	5YR44	20% > 2cm 33% < 2cm 53% HR (S+D)	0	0	WFSAB	Fr	G	G	CF, VF	-	Clear smooth
3	53	HCL	5YR54	53% HR (VIS)	FFMO, G	F	WFSAB	Fm	M	G	FVF	-	Grad smooth
4	102+	C(SC)	2.5YR46	12% > 2cm 16% < 2cm 28% HR (S+D)	° O	F	WCSAB	Fm	P	G (low)	FVF	-	-

Profile Gleyed From: -

Depth to Slowly Permeable Horizon: -

Wetness Class: I

Wetness Grade: 1

Available Water Wheat: 88 mm

Potatoes: 71 mm

Moisture Deficit Wheat: 84 mm

Potatoes: 70 mm

Moisture Balance Wheat: +4 mm

Potatoes: +1 mm

Droughtiness Grade: 3a (borderline Grade 2) (Calculated to 120 cm)

Final ALC Grade: 3a (borderline Grade 2)

Main Limiting Factor(s): Dr

Remarks: H3 slightly pale but not truly gleyed

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE	Av Rainfall: 976 mm	PARENT MATERIAL
Town Farm, Burlescombe	Pit 2	7°N	Ley	ATO: 1429 day °C	Lower Marls
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 199	PSD SAMPLES TAKEN
9/97	15.1.97	ST 0775 1682	PB	Climatic Grade: 1	TS 0-25cm MSL (S59: Z28: C13%)
				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	25	MSL	5YR43	4% > 2cm 22% < 2cm 26% HR (S+D)	0	0	WFSAB	Fr	-	G	CF, VF	-	Clear smooth
2	55	HCL	2.5YR34	10% > 2cm 18% < 2cm 28% HR (S+D)	0	0	WMSAB	Fr	G	G	FF, VF	-	Clear smooth
3	80	C(SC)	2.5YR44	25% HR (VIS)	0	0	WCSAB (WCAB)	Fm	P	G (low)	FVF	-	Grad smooth
4	110+	MSL (LMS)	2.5YR46	15% > 2cm 26% < 2cm 41% HR (S+D)	0	0	M	Fr	P	G (low)	FVF	-	-

Profile Gleyed From: -

Depth to Slowly Permeable Horizon: -

Wetness Class: I

Wetness Grade: 1

Available Water Wheat: 109 mm

Potatoes: 93 mm

Moisture Deficit Wheat: 85 mm

Potatoes: 72 mm

Moisture Balance Wheat: +24 mm

Potatoes: +21 mm

Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 2

Main Limiting Factor(s): Dr

Remarks:

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Town Farm, Burlescombe	Pit 3	3°E	Ley	Av Rainfall: 992 mm ATO: 1403 day °C	Upper Sandstone
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 200 Climatic Grade: 2 Exposure Grade: 1	PSD SAMPLES TAKEN
9/97	15.1.97	ST 0807 1654	PB		TS 0-25 cm MSL (S59: Z25: C16%)

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	20	MSL	5YR43	2% HR (VIS)	0	0	MM, FSAB	Fr	-	G	CF, VF	-	Clear smooth
2	41	HCL	5YR44	5% HR (VIS)	0	0	MCSAB	Fr	M	G	CF, VF	-	Grad smooth
3	68	C	2.5YR46 (2.5YR54)	5% HR (VIS)	CDMO 5YR58	F	MCPr	Fm	P	G	FVF	-	Grad smooth
4	95+	C (SC)	2.5YR46	5% HR (VIS)	MDMO 5YR58 CDMG 5YR64	C	M	Fm	P	P	0	-	-

Profile Gleyed From: 68 cm

Depth to Slowly Permeable Horizon: 68 cm

Wetness Class: III

Wetness Grade: 3a

Available Water Wheat: 110 mm

Potatoes: 101 mm

Moisture Deficit Wheat: 85 mm

Potatoes: 72 mm

Moisture Balance Wheat: +25 mm

Potatoes: +29 mm

Droughtiness Grade: 2 (Calculated to 100 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): We

Remarks: