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Poundbury Farm, Dorchester

**AGRICULTURAL LAND CLASSIFICATION
REPORT OF SURVEY**

**Resource Planning Team
Taunton Statutory Unit**

February 1994

ADAS 

AGRICULTURAL LAND CLASSIFICATION

LAND AT POUNDBURY FARM, DORCHESTER

REPORT OF SURVEY

1. SUMMARY

The site, an area of 147 hectares of land west of Dorchester was graded using the Agricultural Land Classification (ALC) system in February and March 1994. The survey was carried out on behalf of MAFF as part of its Statutory Role in the consultation with West Dorset District Council regarding the West Dorset Consultative Local Plan.

The fieldwork was carried out by ADAS (Resource Planning Team, Taunton Statutory Unit) at a scale of 1:10,000. The information is correct at this scale but any enlargement would be misleading. A total of 115 auger borings and 4 soil profile pits were examined. The distribution of ALC grades identified in the survey area is detailed below and illustrated on the accompanying map.

Distribution of ALC grades: Poundbury Farm

Grade	Area (ha)	% of Survey Area	% of Agricultural Land	
2	94.1	64.0	68.0	
3a	33.0	22.5	23.9	
3b	7.4	5.0	5.3	
4	2.6	1.8	1.9	
5	1.2	0.8	0.9	
Urban	5.1	3.5		
Non-agricultural	2.3	1.5		
Agric buildings	<u>1.3</u>	<u>0.9</u>		
TOTAL	147.0	100.0	100.0	(138.3 ha)

The site, occupies for the most part a gently undulating area, however the steeper slopes in the north-west impose a moderate and severe limitations on the agricultural land quality. The rest of the site is best and most versatile land with the main limiting factor on these well drained clay and chalky soils being workability. On Grade 2 land the topsoil textures impose a slight workability limitation. The subgraded 3a land experiences slightly greater workability limitations and where the chalk is shallow a moderate drought limitation is also experienced.

2. INTRODUCTION

An area of 147 hectares of land to the west of Dorchester, was surveyed on behalf of MAFF as part of its statutory role in the consultation with West Dorset District Council regarding the Consultative Local Plan. The survey was carried out in February and March 1994 by ADAS (Resource Planning Team, Taunton Statutory Unit) using the Agricultural Land Classification (ALC) system and conducted at a scale of 1:10,000 (approximately one sample point for every hectare of agricultural land). The 115 borings were supplemented by 4 soil inspection pits and were used to assess subsoil conditions. The auger boring density was relaxed slightly in the southern part of the Grade 2 block where soils are of a consistent nature. The information is correct at the scale shown but any enlargement would be misleading.

The published provisional 1" to the mile ALC map of the area (MAFF, 1974) shows the majority of the land to be Grade 2 with Grades 3 and 4 to the north and west site. A number of surveys have been done on this site over the last 15 years at various scales of detail. The most recent in 1987 used the original guidelines and found land of Grade 2, 3a, 3b and small areas of 3c and 5. The current survey supersedes any previous work and was undertaken to provide a more detailed representation of the agricultural land quality using the Revised Guidelines and Criteria (MAFF, 1988). These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on the agricultural use. The grading takes account of the top 120 cm of the soil profile. A description of the grades used in the ALC system can be found in Appendix 2.

3. CLIMATE

The grade of the land is determined by the most limiting factor present. The overall climate is considered first because it can have an overriding influence on restricting land to lower grades despite other favourable conditions.

Climatic data for the site was interpolated from the published agricultural climate dataset (Meteorological Office, 1989). The parameters used for assessing climate are accumulated temperature (a measure of the relative warmth of a locality) and average annual rainfall (a measure of overall wetness). The results shown in Table 1 indicate that there is no overall climatic limitation.

Climatic data on Field Capacity Days (FCD) and moisture deficits for wheat (MDW) and potatoes (MDP) are also shown. This data is used in assessing the soil wetness and droughtiness limitations referred to in Section 6. No local climatic factors such as exposure were noted in the survey area. A description of the Soil Wetness classes used is included in Appendix 3.

Table 1 Climatic interpolations: Poundbury Farm

Grid Reference	SY 667 904	SY 675 907
Height (m)	110	100
Accumulated Temperature (day °)	1458	1469
Average Annual Rainfall (mm)	1029	1023
Overall Climatic Grade	1	1
Field Capacity (days)	204	203
Moisture deficit: Wheat (mm)	88	89
Potatoes (mm)	76	78

4. RELIEF AND LANDCOVER

The site occupies for the most part, a gently sloping hill. The highest point being 110 m AOD to the west of Poundbury Farm. North of this point land falls steeply to the by-pass which bounds the site. South of here land falls gently to the lowest point at Maiden Castle Road of 70 m AOD. At the time of survey most of the agricultural land was in arable cultivations or under set aside with the steeper areas being permanent grazing land.

5. GEOLOGY AND SOILS

The published 1:50,000 scale solid and drift geology map, sheet 328 (Geological Survey of England and Wales, 1978), shows all of the site to comprise Upper Chalk.

The soil survey of England and Wales mapped the soils in the area in 1983 at a reconnaissance scale of 1:250,000. This map shows soils to comprise the Andover 2 and Coombe 1 Associations with very small areas of Andover 1 and Upton 1 Associations. These soils have similar descriptions of well drained calcareous silty soils over chalk. Coombe 1 and Upton 1 are likely to be shallow on valley sides.

The recent survey found similar soils to the mapped associations comprising medium and heavy silty clay loam topsoils over variable depths of clay which in turn overlie chalk. In localised areas particularly south of Middle Farm chalk is found immediately below the topsoil.

6. AGRICULTURAL LAND CLASSIFICATION

The distribution of ALC grades identified in the survey area is detailed in Table 2 and shown on the accompanying ALC map. The information is correct at the scale shown but any enlargement would be misleading.

Table 2 Distribution of ALC grades: Poundbury Farm

Grade	Area (ha)	% of Survey Area	% of Agricultural Land	
2	94.1	64.0	68.0	
3a	33.0	22.5	23.9	
3b	7.4	5.0	5.3	
4	2.6	1.8	1.9	
5	1.2	0.8	0.9	
Urban	5.1	3.5		
Non-agricultural	2.3	1.5		
Agric buildings	<u>1.3</u>	<u>0.9</u>		
TOTAL	147.0	100.0	100.0	(138.3 ha)

Grade 2

A total of 94.1 ha of land was found to be Grade 2 (very good quality). This relates to the well drained (Wetness Class I) deep clayey profiles with small amounts of flint. These soils have a slight workability limitation to agricultural use imposed by medium silty clay loam topsoils and the relatively high field capacity days. A slight drought limitation is experienced in profiles where chalk is found at 50-60 cm depth.

Subgrade 3a

A total of 33 ha was found to be of good quality land. These soils are similar to those described above, however in places the heavy silty clay loam topsoils impose a moderate limitation on the workability of these soils. There are also areas where chalk was found at approximately 30 cm depth. This reduces the depth of rootable material to approximately 70 cm imposing a moderate drought limitation, limiting the soil to subgrade 3a.

Subgrade 3b

The area of 3b land to the north-west of the site comprises moderately steep slopes of between 9 and 11°. It is graded 3b due to the limiting effect such slopes have on the use of some types of agricultural machinery.

Grades 4 and 5

The steep slope sloping areas of land have limited use for agriculture due to the restrictions imposed on the safe use of farm machinery. Grade 4 land has slopes of approximately 15° and Grade 5, slopes of 18 to 21°. The earthworks associated with the Roman aqueduct also impose a micro relief limitation.

Urban and non-agricultural

Roads, new buildings and residential areas have been shown as urban on the ALC map and areas of non-agricultural land relate to farm tracks, a silage store, an excavation and soil store associated with nearby developments.

APPENDIX 1

REFERENCES

GEOLOGICAL SURVEY OF ENGLAND AND WALES, 1978, Solid and Drift edition, sheet 339, Dorchester, 1:50,000 scale

MAFF (1974), Agricultural Land Classification Map, sheet 178, Provisional 1:63,360 scale

MAFF (1988), Agricultural Land Classification of England and Wales (Revised Guidelines and Criteria for Grading the Quality of Land), Alnwick

METEOROLOGICAL OFFICE (1989), published climatic data extracted from the agroclimatic dataset, compiled by the Meteorological Office

SOIL SURVEY OF ENGLAND AND WALES (1983), sheet 5, Soils of South-west England, 1:250,000 scale

APPENDIX 2

DESCRIPTION OF ALC 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.

Descriptions of other land categories used on ALC maps

Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture including: housing, industry, commerce, education, transport, religious buildings, cemeteries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

Non-agricultural

'Soft' uses where most of the land could be returned relatively easily to agriculture, including: private park land, public open spaces, sports fields, allotments and soft-surfaced areas on airports/airfields. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

Agricultural buildings

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (eg polythene tunnels erected for lambing) may be ignored.

Open water

Includes lakes, ponds and rivers as map scale permits.

Land not surveyed

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above landcover types, eg buildings in large grounds, and where may be shown separately. Otherwise, the most extensive cover type will usually be shown.

Source: MAFF (1988) Agricultural Land Classification of England and Wales (Revised Guidelines and Criteria for Grading the Quality of Agricultural Land), Alnwick.

APPENDIX 3

DEFINITION OF SOIL WETNESS CLASSES

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: 1023			PARENT MATERIAL		
Poundbury		Pit 1		Flat		P Pasture		ATO: 1469			Chalk		
JOB NO.		DATE		GRID REFERENCE		DESCRIBED BY		FC Days: 203					
7/94		9/2/94		ASP 64		H Lloyd-Jones N A Done		Climatic Grade: 1					
Horizon Number	Lowest Av Depth (cm)	Matrix and Ped Face Colours	Texture	Stoniness: Size, Shape, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Structure: Development Size and Shape	Pores and Fissures	Structural Condition	Consistence	Roots: Abundance, Size and Nature	Calcium Carbonate Content	Mangan Concs etc	Horizon Boundary: Distinctness and form
1	37	10YR44	MZCL	2% HR total	None	-	-	-	-	Many fine + v fine	None	None	Clear/wavy
2	63	10YR58	C	2% HR	-	MDCSAB (some medium SAB)	>0.5%	M	Friable	Many fine + v fine	None	Few mang	Clear/wavy
3	100	75YR46 ped face 10YR54	C	2% HR	-	MDCSAB	>0.5%	M	Friable	Few fine + v fine	None	Few mang	Clear/wavy
4	120	White	Chalk	2% HR		Solid geology							

Profile Gleyed From: None

Depth to Slowly Permeable Horizon: None

Wetness Class: I

Wetness Grade: 2

Available Water Wheat: 143

Potatoes: 121

Moisture Deficit Wheat: 89

Potatoes: 78

Moisture Balance Wheat: 54

Potatoes: 43

Droughtiness Grade: 1

Final ALC Grade: 2

Main Limiting Factor(s): Workability

Remarks:

SITE NAME		PROFILE NO.		SLOPE AND ASPECT		LAND USE		Av Rainfall: 1023			PARENT MATERIAL		
Poundbury		Pit 2		2° East		Plough		ATO: 1469			Chalk		
JOB NO.		DATE		GRID REFERENCE		DESCRIBED BY		FC Days: 203					
7/94		9/2/94		Between 106 and 96		N A Done		Climatic Grade: 1					
Horizon Number	Lowest Av Depth (cm)	Matrix and Ped Face Colours	Texture	Stoniness: Size, Shape, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Structure: Development Size and Shape	Pores and Fissures	Structural Condition	Consistence	Roots: Abundance, Size and Nature	Calcium Carbonate Content	Mangan Concs etc	Horizon Boundary: Distinctness and form
1	30	10YR42	MZCL	3% >2cm 3% <2cm 6% Flint	-	-	-	-	-	Common fine		None	Clear/wavy
2	80	10YR46	ZC	5% HR	FfOM 75Y46	MDCAB	>0.5% pores	M	Friable	Few fine		None	Clear/wavy
3	120	75YR46	C	15% HR (v estimate)	-	MDCSAB	<0.5% pores	M	Friable	None observed	-	Common	

Profile Gleyed From: -
Depth to Slowly Permeable Horizon: -
Wetness Class: 1
Wetness Grade: 2

Available Water Wheat: 113
 Potatoes: 111
Moisture Deficit Wheat: 89
 Potatoes: 78
Moisture Balance Wheat: 44
 Potatoes: 33
Droughtiness Grade: 1

Final ALC Grade: 2
Main Limiting Factor(s): Workability

Remarks:
Pit dug to approximately 11 m!
Depth to chalk is variable from one side of pit to another.
Chalk at 1.50 m where above profile described, and at 1 m on opposite side.

SITE NAME		PROFILE NO.		SLOPE AND ASPECT		LAND USE		Av Rainfall: 1023			PARENT MATERIAL			
Poundbury		Pit 3		2° South		W Wheat		ATO: 1469			Chalk			
JOB NO.		DATE		GRID REFERENCE		DESCRIBED BY		FC Days: 203						
7/94		10/2/94		ASP 68		H Lloyd-Jones N A Done		Climatic Grade: 1						
Horizon Number	Lowest Av Depth (cm)	Matrix and Ped Face Colours	Texture	Stoniness: Size, Shape, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Structure: Development Size and Shape	Pores and Fissures	Structural Condition	Consistence	Roots: Abundance, Size and Nature	Calcium Carbonate Content	Mangan Concs etc	Horizon Boundary: Distinctness and form	
1	30	10YR44	MZCL	3% HR >2cm	-	-	-	-	-	Common fine + v fine	V calc	None	Clear/wavy	
2	70	(10YR46) between chalk blocks	Chalk	3% HR large flints	-	Coarse angular chalk blocks	Well fissured	M	-	Few fine + v fine	V calc	None	Clear/wavy	
3	110	Solid chalk with very few root markings on the sides of chalk blocks.												

Profile Gleyed From: -
Depth to Slowly Permeable Horizon: -
Wetness Class: I
Wetness Grade: 2

Available Water Wheat: 91
 Potatoes: 97
Moisture Deficit Wheat: 89
 Potatoes: 78
Moisture Balance Wheat: 2
 Potatoes: 19
Droughtiness Grade: 3a
 Calculation to 70 cm.

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

Remarks:
Pit dug to 90 cm.
Augered to 120 cm.

SITE NAME		PROFILE NO.		SLOPE AND ASPECT		LAND USE		Av Rainfall: 1023			PARENT MATERIAL		
Poundbury		Pit 4/ASP 20		2° East		Cereal		ATO: 1469			Chalk		
JOB NO.		DATE		GRID REFERENCE		DESCRIBED BY		FC Days: 203					
7/94		10/2/94		ASP 20		N A Done H Lloyd-Jones		Climatic Grade: 1					
Horizon Number	Lowest Av Depth (cm)	Matrix and Ped Face Colours	Texture	Stoniness: Size, Shape, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Structure: Development Size and Shape	Pores and Fissures	Structural Condition	Consistence	Roots: Abundance, Size and Nature	Calcium Carbonate Content	Mangan Concs etc	Horizon Boundary: Distinctness and form
1	27	10YR44	HZCL	3% HR total visual	None	-	Many	-	-	Many fine + medium	None	None	Clear smooth
2	60	10YR46	C	4% HR total visual	None	MDCSAB	Many	M	Friable	Many fine + medium	None	Few	Clear irregular
3	120+	10YR46	CH (clay between blocks)	None	None	Coarse angular blocks	Well fissured	M	-	Few fine (observed to 90 cm between blocks)	Very	None	-

Profile Gleyed From: N/A
Depth to Slowly Permeable Horizon: N/A
Wetness Class: I
Wetness Grade: 3A

Available Water Wheat: 136
Potatoes: 111
Moisture Deficit Wheat: 89
Potatoes: 78
Moisture Balance Wheat: 47
Potatoes: 33
Droughtiness Grade: 1

Final ALC Grade: 3A
Main Limiting Factor(s): Workability

Remarks:
Very soft chalk in horizon 3.
Moist at 90 cm.