

A1

BASINGSTOKE AND DEANE BOROUGH  
LOCAL PLAN

SITE 17 : CHINEHAM LANE, BASINGSTOKE  
AGRICULTURAL LAND CLASSIFICATION  
ALC MAP & REPORT

JUNE 1993

AGRICULTURAL LAND CLASSIFICATION

BASINGSTOKE AND DEANE BOROUGH LOCAL PLAN

SITE 17: CHINEHAM LANE, BASINGSTOKE

1. SUMMARY

- 1.1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality on 22 sites around Basingstoke in Hampshire. The work forms part of MAFF's input to the Basingstoke and Deane Borough Local Plan.
- 1.2 Site 17 comprises 2.6 hectares of land to the north-west of Basingstoke, Hampshire and was surveyed during April 1993. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 2 borings were described in accordance with MAFF's revised guidelines and criteria for grading the quality of agricultural land (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 its agricultural use.

At the time of survey, the land was in permanent grassland.

- 1.3 The distribution of the grades and sub-grades is shown on the attached ALC map and the areas are given in the table below. The map has been drawn at a scale of 1:5000. It is accurate at this scale, but any enlargement may be misleading.

Distribution of Grades and Sub-grades

	<u>Area(ha)</u>	<u>% total agricultural land</u>
Grade 3a	1.0	50
3b	0.8	40
4	0.2	<u>10</u>
Total agricultural area	<u>2.0</u>	100
Non-agricultural	0.1	
Urban	<u>0.5</u>	
Total area of site	<u>2.6 ha</u>	

- 1.4 Appendix 1 gives a general description of the grades and land use categories identified in this survey.
- 1.5 Good to poor quality land has been mapped at this site. Land assigned to grades 3a and 3b is limited by soil droughtiness arising from variable soil depth over chalk. The shallower the profiles the more severe the limitation. As a result very shallow profiles were assigned to grade 3b, whilst deeper soils are less droughty and grade 3a is appropriate. A small unit of grade 4 has been mapped where steep gradients of 13° were measured.

## 2. CLIMATE

- 2.1 The climatic criteria are considered first when classifying land as climate can be overriding in the sense that severe limitations will restrict land to low grades irrespective of favourable site or soil conditions.
- 2.2 The main parameters used in the assessment of the overall climatic limitation are annual average rainfall, as a measure of overall wetness, and accumulated temperature, as a measure of the relative warmth of a locality.
- 2.3 A detailed assessment of the prevailing climate was made by interpolation from a 5km gridpoint dataset. (Met. Office, 1989). The details are given in the table below and these show that there is no overall climatic limitation affecting the site.
- 2.4 No local climatic factors such as exposure or frost risk affect the site.

### Climatic Interpolation

Grid Reference	SU 636 545
Altitude (m)	90
Accumulated Temperature (°days Jan-June)	1430
Average Annual Rainfall (mm)	758
Field Capacity (days)	162
Moisture Deficit, Wheat (mm)	104
Moisture Deficit, Potatoes (mm)	95
Overall Climatic Grade	1

## 3. RELIEF

- 3.1 The site lies at an altitude of approximately 85-90m AOD sloping from the highest point in the north, southwards. To the east, surrounding an area of non-agricultural land a slope gradient of 9° limits land to subgrade 3B. To the west land falls away very steeply with a slope gradient of 13° limiting land to grade 4. Elsewhere relief is not a limitation to agricultural land quality.

## 4. GEOLOGY

- 4.1 The published geology map, sheet 284, Basingstoke (BGS, 1981) shows the underlying geology to be Cretaceous Upper Chalk.
- 4.2 The published soils map sheet 6 "Soils of South East England" (SSEW, 1983) shows the site to be mapped as Andover 1 Association - "Shallow well drained calcareous silty soils over chalk on slopes and crests. Deep calcareous and non-calcareous fine silty soils in valley bottoms". (SSEW, 1983). A detailed examination of soils on the site revealed the predominance of shallow soils over chalk on slopes.

## 5. AGRICULTURAL LAND CLASSIFICATION

- 5.1 Paragraph 3.1 and the table below provides the details of the area measurements for each grade and the distribution of each grade is shown on the attached ALC map.

- 5.2 The location of the soil observation points is shown on the attached Auger Sample Point map.

Subgrade 3A

- 5.3 With inference from detailed information gained on land of similar altitude and relief immediately to the west, land was classified as subgrade 3A. The presence, too, of a long since disused chalk pit on site revealed shallow soils over chalk. This softer, more easily rootable chalk similar to that found at Pit 1 site 18 was found to be penetrated by roots to a depth of approximately 45 cm (into the chalk). Profiles are well drained but suffer from moderate droughtiness due to the proximity of chalk to the surface. Consequently land is classified as subgrade 3A. Within this map unit land of better quality was found but due to its limited extent was not mapped separately.

Subgrade 3B

- 5.4 Land of this quality is found to the east of the site. Profiles typically comprise topsoils of calcareous medium silty clay loam containing 2% flints by volume. This was underlain by harder, less weathered, and less easily rootable chalk of which pits 2 and 3, site 18 immediately to the west are typical. From pit observations roots were found to penetrate the chalk to a depth of 20 cm. Consequently, although well drained, land suffers from significant droughtiness imperfections and is classified as subgrade 3B. In addition slope gradient limits land to this subgrade. Using an optical reading clinometer a slope angle of 9° was recorded.

Grade 4

- 5.5 Poor quality land is mapped at the location of a disused chalk pit mentioned previously. Again using an optical reading clinometer a slope gradient of 13° was recorded limiting land to this grade.
- 5.6 The area mapped as urban includes a house and garden with built-up or hard uses within.
- 5.7 The area mapped as non-agricultural marks the site of another chalk pit which is heavily overgrown with bushes.

ADAS Ref: 1501/32/93  
MAFF Ref: EL 15/144

Resource Planning Team  
Guildford Statutory Group  
ADAS Reading

### Sources of Reference

BRITISH GEOLOGICAL SURVEY, 1981. 1:50,000 scale Solid and Drift edition geology map, sheet 284, Basingstoke.

MAFF, 1988. Agricultural Land Classification of England and Wales. Revised guidelines and criteria for grading the quality of agricultural land. (Alnwick).

METEOROLOGICAL OFFICE, 1989. Climatological datasets for agricultural land classification.

SOIL SURVEY OF ENGLAND AND WALES, 1983. 1:250,000 scale soils map, sheet 6. "Soils of South East England" and accompanying legend.

## APPENDIX 1 DESCRIPTION OF THE GRADES AND SUBGRADES

The ALC grades and subgrades are described below in terms of the types of limitation which can occur, typical cropping range and the expected level and consistency of yield. In practice, the grades are defined by reference to physical characteristics and the grading guidance and cut-offs for limitation factors in Section 3 enable land to be ranked in accordance with these general descriptions. The most productive and flexible land falls into Grades 1 and 2 and Subgrade 3a and collectively comprises about one-third of the agricultural land in England and Wales. About half the land is of moderate quality in Subgrade 3b or poor quality in Grade 4. Although less significant on a national scale such land can be locally valuable to agriculture and the rural economy where poorer farmland predominates. The remainder is very poor quality land in Grade 5, which mostly occurs in the uplands.

Descriptions are also given of other land categories which may be used on ALC maps.

### **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 includes 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 moist 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 parkland, public open spaces, sports fields, allotments and soft-surfaced areas on airports/airfields. Also active mineral working and refuse tips where restoration conditions to 'soft' after-uses may apply.

##### **Woodland**

Includes commercial and non-commercial woodland. A distinction may be made as necessary between farm and non-farm woodland.

##### **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 land cover types, eg buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will usually be shown.

## APPENDIX II

### FIELD ASSESSMENT OF SOIL WETNESS CLASS

#### Definition of Soil Wetness Classes

Wetness Class	Duration of Waterlogging <sup>1</sup>
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years <sup>2</sup> .
II	The soil profile is wet within 70 cm depth for 31-90 days in most years <i>or</i> , 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.
III	The soil profile is wet within 70 cm depth for 91-180 days in most years <i>or</i> , 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.
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 <i>or</i> , 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.
V	The soil profile is wet within 40 cm depth for 211-335 days in most years.
VI	The soil profile is wet within 40 cm depth for more than 335 days in most years.

<sup>1</sup> The number of days specified is not necessarily a continuous period.

<sup>2</sup> 'In most years' is defined as more than 10 out of 20 years.



## SOIL PROFILE DESCRIPTIONS : EXPLANATORY NOTE

Soil profile and pit information obtained during ALC surveys is held on a database. This has commonly used notations and abbreviations as set out below.

### BORING HEADERS

1. GRID REF : National grid square followed by 8 figure grid reference.
2. USE : Land-use at the time of survey.  
The following abbreviations are used.

ARA - arable	PAS/PGR - permanent pasture
WHT - wheat	RGR - rough grazing
BAR - barley	LEY - ley grassland
CER - cereals	CFW - coniferous woodland
OAT - oats	DCW - deciduous woodland
MZE - maize	SCR - scrub
OSR - oilseed rape	HTH - heathland
BEN - field beans	BOG - bog or marsh
BRA - brassicae	FLW - fallow
POT - potatoes	PLO - ploughed
SBT - sugarbeet	SAS - set-aside
FDC - fodder crops	OTH - other
FRT - soft and top fruit	LIN - linseed
HOR/HRT - horticultural crops	
3. GRDNT : Gradient as measured by optical reading clinometer.
4. GLEY/SPL : Depth in centimetres (cm) to gleyed and/or slowly permeable horizons.
5. AP (WHEAT/POTS) : Crop-adjusted available water capacity. The amount of soil water (in millimetres) held in the soil profile that is available to a growing crop (wheat and potatoes are used as reference crops).
6. MB (WHEAT/POTS) : The moisture balance for wheat and potatoes obtained by subtracting the soil moisture deficit from the crop-adjusted available water capacity.
7. DRT: Grade according to soil droughtiness assessed against soil moisture balances.
8. M REL : Micro-relief )  
FLOOD : Flood risk ) If any of these factors are considered  
EROSN : Soil erosion ) significant in terms of the assessment  
EXP : Exposure ) of agricultural land quality a 'y' will  
FROST : Frost prone ) be entered in the relevant column.  
DIST : Disturbed land )  
CHEM : Chemical limitation)

9. **LIMIT** : Principal limitation to agricultural land quality.

The following abbreviations are used:

OC - overall climate	CH - chemical limitations
AE - aspect	WE - wetness
EX - exposure	WK - workability
FR - frost	DR - drought
GR - gradient	ER - erosion
MR - micro-relief	WD - combined soil wetness/soil droughtiness
FL - flooding	ST - topsoil stoniness
TX - soil texture	
DP - soil depth	

### PROFILES & PITS

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

S	- sand
LS	- loamy sand
SL	- sandy loam
SZL	- sandy silt loam
ZL	- silt loam
MZCL	- medium silty clay loam
MCL	- medium clay loam
SCL	- sandy clay loam
HZCL	- heavy silty clay loam
HCL	- heavy clay loam
SC	- sandy clay
ZC	- silty clay
C	- clay

For the sand, loamy sand, sandy loam and sandy silt loam classes, the predominant size of sand fraction may be indicated by the use of prefixes.

F	- fine (more than $\frac{2}{3}$ of the sand less than 0.2 mm)
C	- coarse (more than $\frac{1}{3}$ of sand greater than 0.6 mm)
M	- medium (less than $\frac{2}{3}$ fine sand and less than $\frac{1}{3}$ coarse sand)

The sub-divisions of clay loam and silty clay loam classes according to clay content are indicated as follows:

M	- medium (less than 27% clay)
H	- heavy (27-35% clay)



- ped size                      F - fine  
                                         M - medium  
                                         C - coarse  
                                         VC - very coarse

- ped shape                      S - single grain  
                                         M - massive  
                                         GR - granular  
                                         SB/SAB - sub-angular blocky  
                                         AB - angular blocky  
                                         PR - prismatic  
                                         PL - platy

8. **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

9. **SUBS STR** : Subsoil structural condition recorded for the purpose of calculating profile droughtiness.

G - good  
M - moderate  
P - poor

10. **POR** : Soil porosity. If a soil horizon has less than 0.5% biopores >0.5 mm, a 'y' will appear in this column.

11. **IMP** : If the profile is impenetrable a 'y' will appear in this column at the appropriate horizon.

12. **SPL** : Slowly permeable layer. If the soil horizon is slowly permeable a 'y' will appear in this column.

13. **CALC** : If the soil horizon is calcareous, a 'y' will appear in this column.

14. Other Notations

APW - available water capacity (in mm) adjusted for wheat  
APP - available water capacity (in mm) adjusted for potatoes  
MBW - moisture balance, wheat  
MBP - moisture balance, potatoes

SAMPLE NO.	GRID REF	USE	ASPECT		--WETNESS--		-WHEAT-		-POTS-		M.REL		EROSN	FROST		CHEM	ALC	COMMENTS
			GRDNT	GLEYSPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT			
2	SU63705450	PGR S	03	000	1	1	73	-31	73	-22	3B						DR 3B	ROOT 50
3	SU63605440	PGR S	02	000	1	1	122	18	114	19	2						DR 2	IMP 90

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----			PED		----STONES----			STRUCT/ CONSIST	SUBS				
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH		TOT	STR	POR	IMP	SPL
2	0-29	mzc1	10YR53 00						0	0	HR	2					Y
	29-49	ch	00CH00 00						0	0	HR	5		P			Y
3	0-23	mc1	10YR42 00						0	0	HR	1					
	23-30	mc1	10YR53 00						0	0	HR	1		M			
	30-90	mc1	10YR63 00						0	0	CH	10		M			

SOIL PIT DESCRIPTION

Site Name : BASINGSTOKE SITE 18 Pit Number : 1P

Grid Reference: SU63465439 Average Annual Rainfall : 771 mm  
 Accumulated Temperature : 1419 degree days  
 Field Capacity Level : 165 days  
 Land Use : Cereals  
 Slope and Aspect : 03 degrees SE

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 25	MCL	10YR53 00	0	5		
25- 73	CH	00CH00 00	0	1		

Wetness Grade : 1 Wetness Class : I  
 Gleying : 000 cm  
 SPL : No SPL

Drought Grade : 3A APW : 85 mm MBW : -16 mm  
 APP : 89 mm MBP : -3 mm

FINAL ALC GRADE : 3A  
 MAIN LIMITATION : Droughtiness

SOIL PIT DESCRIPTION

Site Name : BASINGSTOKE SITE 18

Pit Number : 2P

Grid Reference: SU62805440    Average Annual Rainfall : 771 mm  
Accumulated Temperature : 1419 degree days  
Field Capacity Level : 165 days  
Land Use : Permanent Grass  
Slope and Aspect : 02 degrees SE

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 25	MCL	10YR43 00	0	3		
25- 33	HCL	10YR54 66	0	70		
33- 50	CH	00CH00 00	0	3		

Wetness Grade : 1                    Wetness Class : I  
Gleying : 000 cm  
SPL : No SPL

Drought Grade : 3B                    APW : 70 mm    MBW : -31 mm  
APP : 70 mm    MBP : -22 mm

FINAL ALC GRADE : 3B  
MAIN LIMITATION : Droughtiness



SOIL PIT DESCRIPTION

Site Name : BASINGSTOKE SITE 18 Pit Number : 3P

Grid Reference: SU62605440 Average Annual Rainfall : 771 mm  
Accumulated Temperature : 1419 degree days  
Field Capacity Level : 165 days  
Land Use : Cereals  
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 28	MCL	10YR53 00	0	3		
28- 48	CH	00CH00 00	0	5		

Wetness Grade : 1 Wetness Class : I  
Gleying : 000 cm  
SPL : No SPL

Drought Grade : 3B APW : 68 mm MBW : -33 mm  
APP : 68 mm MBP : -24 mm

FINAL ALC GRADE : 3B  
MAIN LIMITATION : Droughtiness