A1
Basingstoke & Deane Local Plan
Site 13: Land at Monk Sherborne, Basingstoke
Agricultural Land Classification
ALC Map and Report
December, 1993

AGRICULTURAL LAND CLASSIFICATION REPORT

LAND AT MONK SHERBORNE, BASINGSTOKE, HAMPSHIRE BASINGSTOKE & DEANE LOCAL PLAN

1. Introduction

1.1 In December, 1993, a detailed Agricultural Land Classification (ALC) was made on 7 hectares of land in two agricultural blocks on the south-western and north-eastern edge of the village of Monk Sherborne north of Basingstoke in Hampshire

1.2 The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group of ADAS in response to a commission by MAFF's Land Use Planning Unit to provide information on the quality of agricultural land affected by possible inclusion in the Basingstoke and Deane Borough Council Local Plan.

1.3 The classification has been made using 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 use for agriculture.

1.4 The fieldwork was carried out with an observation density of approximately one boring per hectare. A total of eight borings, and two soil pits were examined.

Table 1 : Distribution of the Grades and Subgrades

Grade	Area	% of Site
3b	6.8	97.1
Urban	0.2	2.9
Total area of site	7.0	100.0

1.5 All of the agricultural land surveyed has been classified as Subgrade 3b, moderate quality agricultural land . The key limitations are soil wetness and soil workability. In the southern block, heavy clay loam and heavy silty clay loam topsoils overlie poorly structured clay subsoils. These clay horizons significantly impede drainage causing shallow waterlogging. In the northern block, the poorly structured clay subsoils are not present until deeper within the soil profile. However, the clay topsoils found within this area means that this land is also prone to soil wetness and workability limitations.

1.6 The ALC information is shown on the attached map at a scale of 1:5,000. It is accurate at this level but any enlargement may be misleading. This map supersedes any previous ALC information for this site.

1.7 A general description of the grades, subgrades and land use categories is provided in Appendix I. The main classes are described in terms of the type of limitation that can occur, the typical cropping range and the expected level and consistency of yield.

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 an overall climatic limitation are average annual 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 5 kilometre 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. However, climatic factors do interact with soil factors to influence soil wetness and soil droughtiness. At this locality, the moderately high field capacity level (165 days) and the low soil moisture deficits increase the likelihood of soil wetness.

2.4 No local climatic factors such as exposure or frost risk affect the site.

Table 2 : Climatic Interpolations

Grid Reference	SU607565	SU609567
Altitude (m)	105	93
Accumulated Temperature (^{o}day)	1413	1427
Average Annual Rainfall (mm)	771	758
Field Capacity (days)	165	163
Moisture Deficit, Wheat (mm)	99	101
Moisture Deficit, Potatoes (mm)	89	91
Overall Climatic Grade	1	1

3. Relief

3.1 The site occupies flat or gently sloping east facing slopes between 90-105 metres AOD. Nowhere on the site does gradient or relief impose any limitation to the land quality.

4. Geology and Soils

4.1 British Geological Survey, Sheet 284, Basingstoke (1981) shows the whole area to be underlain by Tertiary London Clay.

4.2 The published soils information for the site, as shown on the Soil Survey map of South East England (SSEW, 1983 1:250,000), shows soils of the Wickham 4 Association occurring across the site. These soils are described as 'slowly permeable seasonally waterlogged fine loamy over clayey and fine silty over clayey soils associated with similar clayey soils, often with brown subsoils' (SSEW, 1983).

4.3 *Detailed field examination of the soils on the site generally found poorly drained* profiles similar to those described above.

5. Agricultural Land Classification

5.1 Table 1 provides details of the area and extent of each grade. The distribution of ALC grades is shown on the attached ALC map.

5.2 The location of the soil observation points are shown on the attached auger boring map.

Subgrade 3b

5.3 All of the agricultural land surveyed has been classified as Subgrade 3b, moderate quality land. The key limitations are soil wetness and workability.

5.4 In the southern block, heavy clay loam topsoils overlie upper and lower subsoils of clay. These subsoils show clear evidence of shallow waterlogging in the form of gleying. The upper subsoils exhibit poor structures (moderately developed angular blocky) but are not slowly permeable due to the presence of approximately 10% stone. The lower subsoils are slowly permeable from approximately 65 cm, exhibiting a massive structure with only 1% stone. The stone does not assist drainage as it does not form interconnecting channels. Given the moderately wet (in a regional context) climate at this locality such

profiles are placed into Wetness Class III, the majority of the borings are Wetness Class IV. Only the pit has a Wetness Class of III. These profiles are typified by Pit 1. Across most of the site the upper subsoils are not stony, and the slowly permeable layer starts from below the topsoil. Such profiles are assigned to Wetness Class IV. The interaction between the heavy clay loam topsoils and soil drainage characteristics with the local climatic regime means that this land can be graded no higher than Subgrade 3b.

5.5 In the northern block, profiles are gleyed from below the topsoil but are not slowly permeable within approximately 75 cm. Profiles generally comprise clay to depth, though occasional profiles with lighter textured topsoils (heavy clay loams and heavy silty clay loams) do exist. The interaction between the clay topsoils, soil drainage characteristics and the local climatic regime (moderately wet in regional terms) means that this land also cannot be graded any higher than Subgrade 3b.

5.6 The significant soil wetness limitation across this site may adversely affect seed germination and survival, and inhibits the development of a good root system. In addition, severe restrictions are imposed on cultivations, grazing by livestock and trafficking by machinery.

Urban

5.7 The Urban land shown on the map is occupied by a playground.

ADAS Reference : 1501/155/93
MAFF Reference : EL 15/144

Resource Planning Team
Guildford Statutory Group
ADAS Reading

APPENDIX I

DESCRIPTION OF THE 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 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 or horticultural crops can usually be grown but on some land of this 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 land.

Grade 3 : Good to Moderate Quality Land

Land with moderate limitations which affect the choice of crops, the timing and type of cultivation, harvesting or the level of yield. When 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 the 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 severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture including: housing, industry, commerce, education, transport, religous buildings, cemetries. 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 oopen spaces, sports fields, allotments and soft-surfaced areas on airports. Also active mineral workings 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, eg. buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will be shown.

APPENDIX II

REFERENCES

British Geological Survey (1981), Sheet Number 284, Basingstoke, 1:50,000.

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

Meteorological Office (1989), Climatological Data for Agricultural Land Classification.

Soil Survey of England and Wales (1983), Sheet Number 6, Soils of South East England, 1:250,000, and accompanying legend.

APPENDIX III

DEFINITION OF SOIL WETNESS CLASS

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 180 days, but only wet within 40 cm depth for 31-90 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 present within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31-90 days in most years.

Wetness Class IV

The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth fro more than 210 days in most years **or**, if there is no slowly permeable layer present 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.

APPENDIX IV

SOIL PIT AND SOIL BORING DESCRIPTIONS

Contents : **Soil Abbreviations - explanatory note**

Database Printout - soil pit information

Database Printout - boring level information

Database Printout - horizon level information

SOIL PROFILE DESCRIPTIONS : EXPLANATORY NOTE

Soil pit and auger boring information collected during ALC fieldwork is held on a database. This has commonly used notations and abbreviations as set out below.

Boring Header Information

1. **GRID REF** : national grid square and 8 figure grid reference.

2. **USE** : Land use at the time of survey. The following abbreviations are used.

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

3. **GRDNT** : Gradient as measured by a hand-held optical clinometer.

4. **GLEY/SPL** : Depth in cm to gleying or slowly permeable layers.

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

6. **MB (WHEAT/POTS)** : Moisture Balance.

7. **DRT** : Best grade according to soil droughtiness.

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

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

9. **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		

Soil Pits and Auger Borings

1. **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	**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 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)

2. **MOTTLE COL** : Mottle colour

3. **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%

4. **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

5. **PED. COL** : Ped face colour

6. **STONE LITH** : One of the following is used.

HR : all hard rocks and stones
CH : chalk
ZR : soft, argillaceous, or silty rocks
MSST : soft, medium grained sandstone
SI : soft weathered igneous/metamorphic rock
SLST : soft oolitic or dolimitic limestone
FSST : soft, fine grained sandstone
GH : gravel with non-porous (hard) stones
GH : gravel with non-porous (hard) stones
Stone contents (>2cm, >6cm and total) are given in percentages (by volume).

7. **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

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 appropiate 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

SOIL PIT DESCRIPTION

Site Name : SITE 13, MONK SHERBORNE Pit Number : 1P

Grid Reference: SU60785654 Average Annual Rainfall : 771 mm
Accumulated Temperature : 1419 degree days
Field Capacity Level : 165 days
Land Use : Arable
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 30	HCL	10YR52 00	3	7		
30- 65	C	25Y 63 00	0	10	M	MDCAB
65- 80	C	10YR71 00	0	1	M	MASSIV

Wetness Grade : 3B Wetness Class : III
Gleying :030 cm
SPL :065 cm

Drought Grade : 3A APW : 95 mm MBW : -5 mm
APP : 100mm MBP : 10 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : SITE 13, MONK SHERBORNE Pit Number : 2P

Grid Reference: SU60885675 Average Annual Rainfall : 771 mm
Accumulated Temperature : 1419 degree days
Field Capacity Level : 165 days
Land Use : Arable
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 25	C	10YR52 00	0	0		
25- 52	C	25Y 63 00	0	0	M	MDCSAB
52- 75	C	25Y 62 00	0	20	M	
75- 90	C	75YR61 00	0	0	M	WDCSAB

Wetness Grade : 3B Wetness Class : II
Gleying :025 cm
SPL :075 cm

Drought Grade : 2 APW : 110mm MBW : 10 mm
APP : 109mm MBP : 19 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Wetness

SAMPLE NO.	GRID REF	USE	ASPECT	GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M.REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT		ALC	COMMENTS
1	SU60905680	ARA	S	01	0		2	3A	144	44	117	27	1				WE		3A	NO SPL
1P	SU60785654	ARA			030	065	3	3B	95	-5	100	10	3A				WE		3B	
2	SU60905670	ARA			028	078	2	3A	119	19	120	30	2				WE		3A	DEEP SPL
2P	SU60885675	ARA			025	075	2	3B	110	10	109	19	2				WE		3B	CLAY T/S
3	SU60705650	ARA	N	01	035	035	4	3B	83	-17	89	-1	3A				WE		3B	
4	SU60805650	ARA			030	040	4	3B	95	-5	107	17	3A				WE		3B	
5	SU60705640	ARA			030		2	3A	82	-18	85	-5	3A				WE		3A	IMPEN 55 -Q WC
6	SU60805640	ARA			025	025	4	3B	83	-17	89	-1	3A				WE		3B	
7	SU60805632	ARA			025	025	4	3B	85	-15	91	1	3A				WE		3B	
8	SU60925677	ARA			030	075	2	3A	119	19	117	27	2				WE		3A	DEEP SPL

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC
1	0-35	hcl	10YR42 00	75YR58 00	C			Y	0	0	HR	2						
	35-70	hcl	10YR63 00	75YR58 00	M			Y	0	0	HR	2		M				
	70-120	c	10YR63 00	75YR58 00	M			Y	0	0	HR	2		M				
1P	0-30	hcl	10YR52 00						3	0	HR	7						
	30-65	c	25Y 63 00	75YR58 00	M			Y	0	0	HR	10	MDCAB FM	P				
	65-80	c	10YR71 00	75YR58 00	M			Y	0	0	HR	1	MASSIV FM	P	Y		Y	
2	0-28	hzcl	10YR52 00						0	0		0						
	28-50	hcl	10YR53 00	000C00 00	C			Y	0	0		0		M				
	50-78	c	25Y 63 00	000C00 00	M			Y	0	0		0		M				
	78-90	c	75YR62 00	000C00 00	M			Y	0	0		0		P	Y		Y	
2P	0-25	c	10YR52 00						0	0		0						
	25-52	c	25Y 63 00	10YR56 00	M			Y	0	0		0	MDCSAB FM	M	Y			
	52-75	c	25Y 62 00	10YR56 00	M			Y	0	0	HR	20		M				
	75-90	c	75YR61 00	75YR58 00	M			Y	0	0		0	WDCSAB FM	P	Y		Y	
3	0-35	hcl	25Y 42 00						5	0	HR	10						
	35-60	c	25Y 63 00	75YR58 00	M			Y	0	0	HR	2		P	Y		Y	
4	0-30	hzcl	10YR52 00						2	0	HR	8						
	30-40	c	25Y 63 00	000C00 00	M			Y	0	0	HR	2		M				
	40-70	c	25Y 63 00	000C00 00	M			Y	0	0	HR	1		P	Y		Y	
5	0-30	hcl	25Y 42 00						5	0	HR	10						
	30-55	c	25Y 63 00	000C00 00	M			Y	0	0	HR	10		M				
6	0-25	hzcl	10YR52 00						2	0	HR	8						
	25-60	c	10YR63 00	000C00 00	M			Y	0	0	HR	1		P	Y		Y	
7	0-25	hzcl	10YR52 00						1	0	HR	4						
	25-60	c	10YR62 00	000C00 00	M			Y	0	0	HR	1		P	Y		Y	
8	0-30	hcl	10YR52 00						0	0	HR	1						
	30-50	c	25Y 63 00	000C00 00	M			Y	0	0		0		M				
	50-75	c	25Y 63 00	000C00 00	M			Y	0	0		0		M				
	75-95	c	75YR52 00	000C00 00	M			Y	0	0		0		P	Y		Y	