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NEWBURY LOCAL PLAN
SITE 23: DOWNEND, CHIEVELEY
AGRICULTURAL LAND CLASSIFICATION
ALC MAP & REPORT
FEBRUARY 1994

**NEWBURY LOCAL PLAN
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AGRICULTURAL LAND CLASSIFICATION REPORT**

1.0 Summary

1.1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality on an number of sites in the Newbury District of Berkshire. The work forms part of MAFF's statutory input to the preparation of the Newbury Local Plan.

1.2 Approximately 7 hectares of land relating to site 23 at Downend in Chieveley was surveyed in February 1994. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 7 soil auger borings and one soil inspection pit were assessed 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 use for agriculture.

1.3 The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group of ADAS.

1.4 At the time of the survey the agricultural land use on the site was cereal cropping.

1.5 The distribution of grades and subgrades 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 1:5,000. It is accurate at this scale, but any enlargement would be misleading. This map supersedes any previous survey information for this site.

Table 1 : Distribution of Grades and Subgrades

<u>Grade</u>	<u>Area (ha)</u>	<u>% of Site</u>	<u>% of Agricultural Area</u>
1	1.8	24.7	24.7
2	5.5	75.3	75.3
Total area of site	7.3	100%	100%(7.3ha)

1.6 Appendix 1 gives a general description of the grades, subgrades and land use categories identified in the survey. 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.

1.7 The majority of the site has been classified as very good quality, grade 2, land with a small area of excellent quality, grade 1, land in the south west corner. The grade 2 land comprises slightly stony medium clay loam topsoils over either more stony heavy clay loams, becoming clay at depth, or slightly gleyed clay passing to sandy lower subsoils. The stone content in these profiles leads to a minor reduction in the amount of profile available water while the slight gleying, occurring in the clay, shows that elsewhere there is also a slight drainage impedence. The grade 2 land, therefore, suffers from either a slight soil wetness or droughtiness limitation. The grade 1 land, on the other hand, comprises medium clay loam topsoils over freely draining heavy clay loam and clay subsoils which show no signs of either soil wetness or droughtiness.

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 (degree days Jan-June), 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. However climatic factors do interact with soil properties to influence soil wetness and droughtiness limitations.

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

Table 2 : Climatic Interpolation

Grid Reference :	SU475752
Altitude (m) :	132
Accumulated Temperature (days) :	1377
Average Annual Rainfall (mm) :	702
Field Capacity (days) :	150
Moisture Deficit, Wheat (mm) :	101
Moisture Deficit, Potatoes (mm) :	91
Overall Climatic Grade :	1

3.0 Relief

3.1 The site lies at an altitude of approximately 132m. AOD and rises very gently towards the north.

4.0 Geology and Soil

4.1 British Geological Survey (1947), sheet 267, Hungerford shows the entire site to be underlain by Clay with Flints and Tertiary Debris.

4.2 The Soil Survey Map of South East England (SSEW, 1983, 1:250,000), shows that the majority of the soils on this site comprise the Hornbeam 2 Association with a small strip of Wickham 3 along the southern edge of the site. The Hornbeam 2 Association is described as 'Deep fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging. Some well drained fine loamy and fine silty over clayey and clayey soils. Some soils very flinty.' (SSEW 1983), while the Wickham 3 Association is described as 'slowly permeable, seasonally waterlogged fine loamy over clayey and coarse loamy over clayey soils, and similar more permeable soils with slight waterlogging. Some deep coarse loamy soils affected by ground water. Land slips locally.' (SSEW 1983). Detailed field examination revealed the soils on this site to be more closely related to the Hornbeam Association than the Wickham Association.

5.0 Agricultural Land Classification

5.1 Table 1 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 are shown on the attached sample point map.

5.3 Grade 1

A small block of land to the south west of the site has been identified as Grade 1. The profiles comprise a medium clay loam topsoil, with a very minimal stone content (2-3% flint < 2cm diameter), over a marginally more stony (2-6% flints < 2cm diameter) heavy clay loam and clay subsoil. The profiles exhibit only slight mottling from 60cm depth and slight gleying from 75cm and are therefore free draining. The stone content is also only slight giving rise to soils with adequate reserves of available water for crop growth. With the favourable climatic conditions of this region and the deep, well drained soils the land has been classified as Grade 1.

5.4 Grade 2

The remaining land has been classified as Grade 2 due to either a slight soil droughtiness or soil wetness limitation. The profiles on the eastern half of the site comprise slightly stony (3-5% flints < 2cm diameter) medium clay loam topsoils over less stony (1-2% flints < 2cm diameter) clay upper subsoils. Directly above 40cm depth, but occasionally a little deeper, the clay becomes slightly gleyed with common distinct ochreous mottles in a yellowish matrix. Below 62cm depth the subsoil texture grows lighter with either heavy clay loam or sandy clay loam over medium sandy loam and finally loamy medium sand. The stone content remains low (1-2% flints < 2cm diameter) while the horizons continue to exhibit slight gleying. Despite the lack of a slowly permeable layer within the profile a slight drainage problem is evident such that Grade 2 is appropriate. The western half of the site, on the other hand, suffers from slight soil droughtiness. These profiles again comprise slightly stony medium clay loam topsoils but they become more stony (4-5% flints < 2cm diameter) in the upper subsoils. This stone content reduces the amount of available water in the profile for crops by a small amount and thus restricts the land to grade 2 on droughtiness. The heavy clay loam and clay subsoils do show signs of slightly impeded drainage being slightly gleyed from 45cm depth but this does not cause a wetness restriction. The topsoil texture does not impose any workability limitation either. Occasional borings within this mapping unit were of slightly better quality but were not of sufficient distribution to record separately.

ADAS REFERENCE : 0202/017/93
MAFF REFERENCE : EL 02/0297

Resource Planning Team
Guildford Statutory Group
ADAS Reading

APPENDIX I

DESCRIPTION OF THE GRADES AND SUB-GRADES

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 on 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. When more demanding crops are grown yields are generally lower or more variable than on land in grades 1 and 2.

Sub-grade 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.

Sub-grade 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 very 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 : 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 re-claimed 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 workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

Woodland

Includes commercial and non-commercial 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 (1947), Sheet No.267, Hungerford, 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 No.6, Soils of South East England, 1:250,000. And accompanying legend.

APPENDIX III

DEFINITION OF SOIL WETNESS CLASSES

Wetness Class I

The soil profile is not wet within 70cm depth for more than 30 days in most years.

Wetness Class II

The soil profile is wet within 70cm depth for 31-90 days in most years or, if there is no slowly permeable layer within 80cm depth, it is wet within 70cm for more than 90 days, but not wet within 40cm depth for more than 30 days in most years.

Wetness Class III

The soil profile is wet within 70cm depth for 91-180 days in most years or, if there is no slowly permeable layer within 80cm depth, it is wet within 70cm for more than 180 days, but only wet within 40cm depth for 31-90 days in most years.

Wetness Class IV

The soil profile is wet within 70cm depth for more than 180 days but not wet within 40cm depth for more than 210 days in most years or, if there is no slowly permeable layer within 80cm depth, it is wet within 40cm depth for 91-210 days in most years.

Wetness Class V

The soil profile is wet within 40cm depth for 211-335 days in most years.

Wetness Class VI

The soil profile is wet within 40cm depth for more than 335 days in most years.

(The number of days is not necessarily a continuous period. 'In most years' is defined as more than 10 out of 20 years.)

APPENDIX IV

SOIL PIT AND SOIL BORING DESCRIPTIONS

- Contents :
- * Soil Abbreviations : Explanatory Note
 - * Soil Pit Descriptions
 - * 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 HRT : Horticultural Crops PGR : Permanent Pasture LEY : Ley Grass RGR : Rough Grazing
SCR : Scrub CFW : Coniferous Woodland DCW : Deciduous Woodland HTH : Heathland BOG : Bog or Marsh
FLW : Fallow PLO : Ploughed SAS : Set aside OTH : Other

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 : Soil Erosion Risk WD : Combined 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 MSST : soft, medium or coarse grained sandstone

SI : soft weathered igneous or metamorphic SLST : soft oolitic or dolimitic limestone

FSSST : soft, fine grained sandstone ZR : soft, argillaceous, or silty rocks CH : chalk

GH : gravel with non-porous (hard) stones GS : gravel with porous (soft) stones

Stone contents (> 2cm, > 6cm and total) are given in percentages (by volume).

7. **STRUCT** : the degree of development, size and shape of soil pedes 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 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	DEPTH	TEXTURE	COLOUR	----MOTTLES----		PED		----STONES----			STRUCT/ CONSIST	SUBS					
				COL	ABUN	CONT	COL.	GLE	>2	>6		LITH	TOT	STR	POR	IMP	SPL
1	0-27	mc1	10YR42 00						2	0	HR	3					
	27-45	c	75YR54 00						0	0	HR	5		M			
	45-90	c	75YR54 00	75YR58 00	C		00MN00 00	S	0	0	HR	1		M			
1P	0-24	mc1	10YR42 00						2	0	HR	3					
	24-39	c	75YR54 00	75YR58 00	F				0	0	HR	2	MDCSAB	FR	M		
	39-62	c	75YR58 00	10YR73 00	C		00MN00 00	S	0	0	HR	2	MDCSAB	FM	M		
	62-105	sc1	75YR56 00	75YR68 00	C		10YR72 00	S	0	0	HR	2	WKCOAB	FR	M		
	105-115	ms1	75YR56 00	75YR58 00	C		10YR72 00	S	0	0	HR	2			M		
	115-120	lms	75YR56 00	75YR58 00	C		10YR62 00	S	0	0	HR	2			M		
2	0-26	mc1	10YR42 00						2	0	HR	3					
	26-45	c	75YR46 00	75YR58 00	F				0	0	HR	1		M			
	45-90	c	75YR46 00	75YR58 00	C				S	0	HR	1		M			
	90-98	sc1	10YR74 76	75YR58 00	C				Y	0		0		M			
	98-120	lms	10YR74 78	75YR58 00	C				Y	0		0		M			
3	0-28	mc1	10YR42 00						1	0	HR	2					
	28-58	hc1	10YR44 00						0	0	HR	4		M			
	58-68	hc1	10YR54 00	75YR58 00	C		10YR63 00	S	0	0	HR	4		M			
	68-100	c	75YR54 00	75YR58 00	C		00MN00 00	S	0	0	HR	1		M			
4	0-28	mc1	10YR43 00						2	0	HR	3					
	28-62	c	75YR54 00	75YR58 00	F				0	0		0		M			
	62-120	c	75YR54 00	10YR64 00	C				S	0	HR	1		M			
5	0-25	mc1	10YR42 00						1	0	HR	2					
	25-75	hc1	10YR44 00						0	0	HR	2		M			Y
	75-98	hc1	10YR43 00	10YR53 00	C		00MN00 00	S	0	0		0		M			Y
	98-120	c	75YR54 00	75YR58 00	C		10YR63 00	S	0	0		0		M			Y
6	0-30	mc1	10YR42 00						2	0	HR	3					
	30-45	mc1	10YR44 00						0	0	HR	6		M			
	45-58	hc1	10YR44 00	00MN00 00	F				0	0	HR	5		M			
	58-120	c	75YR54 00	10YR58 00	F		00MN00 00		0	0	HR	5		M			
7	0-26	mc1	10YR42 00						3	0	HR	5					
	26-90	c	75YR56 00	75YR58 00	C		00MN00 00	S	0	0	HR	2		M			
	90-100	hc1	75YR56 00						S	0	CH	5		M			Y

SAMPLE NO.	GRID REF	USE	ASPECT		--WETNESS--		-WHEAT-		-POTS-		M.REL		EROSN	FROST	CHEM	ALC	COMMENTS
			GRDNT	GLEYS	SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT	
	SU47407530	CER	SW	01	045	1	1	114	13	114	23	2				DR	2
1P	SU47507530	CER	SW	01	039	1	1	148	47	113	22	1					1
2	SU47507530	CER	SW	01	045	1	1	134	33	115	24	1					1
	SU47407520	CER	SW	01	058	1	1	126	25	114	23	2				DR	2
	SU47507520	CER	SW	01	062	1	1	140	39	116	25	1					1
	SU47407510	CER	S	01	075 098	1	1	149	48	115	24	1					1
	SU47507510	CER	SW	01		1	1	138	37	113	22	1					1
7	SU47607510	CER	SE	01	026	1	1	124	23	114	23	2				DR	2

SOIL PIT DESCRIPTION

Site Name : SITE 23,DOWNEND CHIEVELE Pit Number : 1P

Grid Reference: SU47507530 Average Annual Rainfall : 702 mm
 Accumulated Temperature : 1377 degree days
 Field Capacity Level : 150 days
 Land Use : Cereals
 Slope and Aspect : 01 degrees SW

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 24	MCL	10YR42 00	2	3		
24- 39	C	75YR54 00	0	2	F	MDCSAB
39- 62	C	75YR58 00	0	2	C	MDCSAB
62-105	SCL	75YR56 00	0	2	C	WKCOAB
105-115	MSL	75YR56 00	0	2	C	
115-120	LMS	75YR56 00	0	2	C	

Wetness Grade : 2 Wetness Class : II
 Gleying : 039 cm
 SPL : cm

Drought Grade : 1 APW : 148mm MBW : 47 mm
 APP : 113mm MBP : 22 mm

FINAL ALC GRADE : 2
 MAIN LIMITATION : Wetness