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**NEWBURY DISTRICT LOCAL PLAN
Housing Omission Site 5173,
East Lane, Chieveley**

**Agricultural Land Classification
ALC Map and Report**

September 1997

**Resource Planning Team
Eastern Region
FRCA Reading**

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AGRICULTURAL LAND CLASSIFICATION REPORT

NEWBURY DISTRICT LOCAL PLAN Housing Omission Site 5173, East Lane, Chieveley

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 5.5ha of land at East Lane, Chieveley. The survey was carried out during September 1997.
2. The survey was undertaken by the Farming and Rural Conservation Agency (FRCA)¹ on behalf of the Ministry of Agriculture, Fisheries and Food (MAFF), in connection with the Newbury District Local Plan. This survey supersedes any previous ALC information for this land.
3. The work was conducted by members of the Resource Planning Team in the Eastern Region of FRCA. The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF, 1988). A description of the ALC grades and subgrades is given in Appendix I.
4. At the time of survey the land was in arable use. There was a small area of scrub in the south west corner which is mapped as 'Other land'.

SUMMARY

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10,000. It is accurate at this scale but any enlargement would be misleading.
6. The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
2	5.4	100.0	98.2
Other land	0.1		1.8
Total surveyed area	5.4	100.0	98.2
Total site area	5.5		100.0

7. The fieldwork was conducted at an average density of 1 borings per hectare of agricultural land. A total of 7 borings and 1 soil pit was described.

¹ FRCA is an executive agency of MAFF and the Welsh Office

8. The site is mapped as Grade 2 (very good quality) agricultural land which is restricted by both slight soil wetness and soil droughtiness limitations. Typically, soil profiles comprise non-calcareous, medium clay loam topsoils over heavy clay loam upper subsoils and clay lower subsoils. Some of the upper horizons may also contain an appreciable sand content. Drainage in the lower subsoil is impeded by poor soil structure resulting in a slight soil wetness limitation. The flinty lower subsoil and the occurrence of chalk at some locations reduces the amount of water in the soil which crops can extract and therefore causes a slight droughtiness limitation. Thus minor limitations will result in a slightly reduced flexibility of use and may produce a lower or more variable crop yield than land of higher quality.

FACTORS INFLUENCING ALC GRADE

Climate

9. Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.

10. The key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5km grid datasets using the standard interpolation procedures (Met. Office, 1989).

Table 2: Climatic and altitude data

Factor	Units	Values	
		SU 479 742	SU 478 741
Grid reference	N/A	SU 479 742	SU 478 741
Altitude	m, AOD	119	122
Accumulated Temperature	day°C (Jan-June)	1392	1389
Average Annual Rainfall	mm	701	702
Field Capacity Days	days	151	151
Moisture Deficit, Wheat	mm	102	102
Moisture Deficit, Potatoes	mm	93	92
Overall climatic grade	N/A	Grade 1	Grade 1

11. 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.

12. The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR), as a measure of overall wetness, and accumulated temperature (AT0, January to June), as a measure of the relative warmth of a locality.

13. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation. Local climatic factors, such as exposure and frost risk do not have a significant adverse affect on land quality at this location. The site is climatically Grade 1. However, climatic factors do interact with soil properties to influence soil wetness and soil droughtiness. At this locality the climate is about average for Southeast England.

Site

14. The site lies at altitudes in the range 115-125m AOD. The highest land is found along the north-western boundary with land falling away gently to the south-eastern boundary. The site is not adversely affected by any site restrictions (i.e., steep gradient, uneven micro-relief or flooding).

Geology and soils

15. The most detailed published geological information for the site (BGS, 1971) shows the majority of it to be underlain by clay-with-flints, with Upper Chalk on the lower land to the east.

16. The most detailed published soils information covering the area (SSEW, 1983) maps soils of the Frilsham association. These soils are described as, 'well drained mainly fine loamy soils over chalk, some calcareous. Shallow calcareous fine loamy and fine silty soils in places' (SSEW, 1983). The majority of soils were consistent with this description with most observed to have clayey lower subsoils or were impenetrable to the auger being impeded by flint.

AGRICULTURAL LAND CLASSIFICATION

17. The details of the classification of the site are shown on the attached ALC map and the area statistics of each grade are given in Table 1, page 1.

18. The location of the auger borings and pits is shown on the attached sample location map and the details of the soils data are presented in Appendix II.

Grade 2

19. The entire site has been mapped as Grade 2 land (very good quality).

20. Grade 2 land is restricted by a combined soil wetness and soil droughtiness limitation. Most of the soils comprise non-calcareous medium clay loam topsoils. These may contain up to 10 % total flints by volume (2 % > 2cm in size). Topsoils overly heavy clay loam or sandy clay loam upper subsoils, which contain up to 20 % total flints by volume. These pass into similar or poorly structured clay at depth (45-67cm+) with up to 25 % by volume total flints. Soil pit 1 (see Appendix II) is typical of these soils. It proved the existence of poorly structured clay lower horizons which are slowly permeable and thereby impede drainage. The depth to these slowly permeable clay subsoils and lack of gleying within 40cm results in soils being typically assigned to wetness class II. This combination of wetness class, related to topsoil texture and local climatic conditions, gives rise to Grade 2. The increasing stone content down the profile of these soils also restricts the amount of water that these soils can hold. Moisture balance calculations also restrict these soils to Grade 2. The overall effect of this on land quality results in reductions in the level of yield and yield consistency, coupled with slight reductions in flexibility of agricultural use due to wetness limitations.

21. In a couple of borings within the Grade 2 mapping unit chalk was encountered within 60-70cm of the surface. Drainage is improved at these locations, although moisture balance calculations indicate a lower profile available water capacity than adjacent borings, giving a final grade for these shallower borings close to the Subgrade 3a/2 boundary.

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SOURCES OF REFERENCE

British Geological Survey (1971) *Sheet No. 267, Hungerford, 1:50,000, Drift Edition.*
BGS: London.

Ministry of Agriculture, Fisheries and Food (1988) *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land.* MAFF: London.

Met. Office (1989) *Climatological Data for Agricultural Land Classification.*
Met. Office: Bracknell.

Soil Survey of England and Wales (1983) *Sheet 6, Soils of South-East England, 1:250,000.*
SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in South East England*
SSEW: Harpenden

APPENDIX I

DESCRIPTIONS 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 (e.g. 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.

APPENDIX II

SOIL DATA

Contents:

Sample location map

Soil abbreviations - explanatory note

Soil pit descriptions

Soil boring descriptions (boring and horizon levels)

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

Boring Header Information

1. **GRID REF:** national 100 km 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	OTH	Other
DCW:	Deciduous woodland	BOG:	Bog or marsh	SAS:	Set-Aside
HTH:	Heathland	HRT:	Horticultural crops	PLO:	Ploughed

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

4. **GLEYSPL:** Depth in centimetres (cm) to gleying and/or slowly permeable layers.

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

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

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

8. 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				

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

OC:	Overall Climate	AE:	Aspect	ST:	Topsoil Stoniness
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
EX:	Exposure				

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
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)

2. **MOTTLE COL:** Mottle colour using Munsell notation.
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 using Munsell notation.
6. **GLEYS:** If the soil horizon is gleyed a 'Y' will appear in this column. If slightly gleyed, an 'S' will appear.
7. **STONE LITH:** Stone Lithology - one of the following is used:

HR:	all hard rocks and stones	FSST:	soft, fine grained sandstone
ZR:	soft, argillaceous, or silty rocks	CH:	chalk
MSST:	soft, medium grained sandstone	GS:	gravel with porous (soft) stones
SI:	soft weathered igneous/metamorphic rock	GH:	gravel with non-porous (hard) stones

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

8. **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	
Ped shape	S: single grain	M: massive
	GR: granular	AB: angular blocky
	SAB: sub-angular blocky	PR: prismatic
	PL: platy	

9. **CONSIST:** Soil consistence is described using the following notation:

L: loose	FM: firm	EH: extremely hard
VF: very friable	VM: very firm	
FR: friable	EM: extremely firm	

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

G: good **M:** moderate **P:** poor

11. **POR:** Soil porosity. If a soil horizon has less than 0.5% biopores >0.5 mm, a 'Y' will appear in this column.
12. **IMP:** If the profile is impenetrable to rooting a 'Y' will appear in this column at the appropriate horizon.
13. **SPL:** Slowly permeable layer. If the soil horizon is slowly permeable a 'Y' will appear in this column.
14. **CALC:** If the soil horizon is calcareous, a 'Y' will appear in this column.
15. 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 : EAST LANE, CHIEVELEY Pit Number : 1P

Grid Reference: SU47707430 Average Annual Rainfall : 701 mm
 Accumulated Temperature : 1392 degree days
 Field Capacity Level : 151 days
 Land Use : Cereals
 Slope and Aspect : degrees E

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 25	MCL	10YR43 00	2	9	HR					
25- 42	HCL	10YR44 00	0	15	HR				M	
42- 63	HCL	10YR53 00	0	10	HR	F	MDCSAB	FR	M	
63-120	C	10YR66 00	0	25	HR	C	MDCAB	FM	P	

Wetness Grade : 2 Wetness Class : II
 Gleying : 063 cm
 SPL : 063 cm

Drought Grade : 2 APW : 119mm MBW : 17 mm
 APP : 102mm MBP : 9 mm

FINAL ALC GRADE : 2
 MAIN LIMITATION : Wetness

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	
1	SU47707430	CER	N		045 045	3	3A	90	-12	102	9	3A		WE	3A	SEE 1P
1P	SU47707430	CER	E		063 063	2	2	119	17	102	9	2		WE	2	SEE 1P
2	SU47707420	CER	N	01	000	1	1	98	-4	108	15	3A		WD	2	SEE 1P
3	SU47807420	CER	N	01		1	1	96	-6	103	10	3A		DR	2	BORDER 3A
4	SU47907420	CER	E	02		2	2	113	11	108	15	2		WD	2	SEE 1P
5	SU47707410	CER			052	2	2	94	-8	101	8	3A		WD	2	SEE 1P
6	SU47807410	CER			075 075	2	2	105	3	109	16	3A		WD	2	SEE 1P
7	SU47877427	CER	E	01		1	1	94	-8	101	8	3A		DR	3A	IMPCH 65CM

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----			PED		----STONES----			STRUCT/ CONSIST	SUBS			CALC	
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH		TOT	STR	POR		IMP
1	0-27	mc1	10YR42 00						0	0	HR	3					
	27-45	hc1	10YR44 00						0	0	HR	20		M			
	45-70	c	10YR64 00	10YR56 00	C				Y	0	0	HR	5		P		Y
1P	0-25	mc1	10YR43 00						2	0	HR	9					
	25-42	hc1	10YR44 00						0	0	HR	15		M			
	42-63	hc1	10YR53 00	10YR53 00	F		10YR54 00		0	0	HR	10	MDCSAB	FR	M		DUG TO 85CM
	63-120	c	10YR66 00	10YR72 00	C		75YR53 00	Y	0	0	HR	25	MDCAB	FM	P		Y
2	0-27	mc1	10YR42-00						2	0	HR	5					
	27-45	hc1	10YR43-00						0	0	HR	5		M			
	45-65	hc1	10YR43-00	75YR56-00	M		00MN00-00	S	0	0	HR	10		M			
	65-70	ch	10YR81-00						0	0		0		P			
3	0-28	mc1	10YR43 00						0	0	HR	3					
	28-60	sc1	10YR44 00				00MN00 00		0	0	HR	15		M			
	60-72	sc1	10YR54 00				00MN00 00		0	0	HR	15		M			
4	0-28	mc1	10YR43 00						0	0	HR	5					
	28-67	hc1	10YR54 44				00MN00 00		0	0	HR	10		M			
	67-100	c	10YR43-00	75YR56-	M			S	0	0	HR	25		P		Y	QUERY SPL
5	0-27	mc1	10YR31 00						0	0	HR	3					
	27-52	hc1	10YR32 00				00MN00 00		0	0	HR	2		M			
	52-62	hc1	10YR42 00	10YR56 00	M		00MN00 00	Y	0	0	HR	10		M			
6	0-26	mc1	10YR42 00						0	0	HR	3					
	26-48	hc1	10YR44 00				00MN00 00		0	0	HR	10		M			
	48-75	c	10YR54 00						0	0	HR	10		M			
	75-85	c	10YR66 00	10YR72 00	M		00MN00 00	Y	0	0	HR	10		P		Y	
7	0-28	mc1	10YR42 00						0	0	HR	5					Y
	28-58	hc1	10YR54 00						0	0	HR	5		M			Y
	58-65	ch	10YR81 00						0	0	HR	2		P			Y