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NEWBURY LOCAL PLAN  
SITE 40 : SMITHAM BRIDGE RD,  
HUNGERFORD  
AGRICULTURAL LAND CLASSIFICATION  
ALC MAP & REPORT  
JANUARY 1994

**NEWBURY LOCAL PLAN  
SITE 40 : LAND AT SMITHAM BRIDGE ROAD, HUNGERFORD  
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 a 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 3 hectares of land relating to site 40 west of Hungerford was surveyed in January 1994. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 4 soil auger borings and 1 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 longterm 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 landuse 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>
2	1.3	52.0	61.9
3a	0.5	20.0	23.8
4	0.3	12.0	14.3
Urban	0.4	16.0	100.0 (2.1ha)
Total area of site	2.5	100.0	

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 agricultural land on the site has been classified as Grades 2 and 4 and Subgrade 3a, with soil droughtiness, workability and flood risk as the main limitations. The area classified as Grade 2 shows both a slight droughtiness and workability limitation. The soils in this mapping unit overlie chalk at depth, consequently there is a slight restriction on the amount of profile available water for crop growth. Also, these soils have a slight workability limitation due to heavy topsoil textures thereby restricting the number of days when this land can be worked effectively with machinery. Soils in the area mapped as Subgrade 3a tend to be shallower over chalk, and therefore the land shows a moderate soil droughtiness limitation. In the east of the site, adjacent to a water course, the land has been mapped as Grade 4 as it has been judged to be at risk from periodic flooding. Flooding can have a detrimental effect on crop yield and may give rise to soil management problems.

## 2.0 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.

2.4 No local climatic factors such as exposure or frost risk affect the site. However, climatic factors do interact with soil factors to influence soil wetness and droughtiness limitations.

Table 2 : Climatic Interpolation

Grid Reference :	SU 329 683
Altitude (m) :	105
Accumulated Temperature (days) :	1415
Average Annual Rainfall (mm) :	753
Field Capacity (days) :	170
Moisture Deficit, Wheat (mm) :	102
Moisture Deficit, Potatoes (mm) :	92
Overall Climatic Grade :	1

## 3.0 Relief

3.1 The site lies at an altitude ranging between 100-110 metres, falling from west to east. On no part of the site do gradient or relief pose any limitation to agricultural use.

## 4.0 Geology and Soil

4.1 The published geological map for the site (BGS 1971, Sheet 267: Hungerford ) shows the underlying geology to be Upper Chalk on the higher ground in the west of the site, and alluvium in the east of the site.

4.2 The published soils information for the area (SSEW 1983, Sheet 6: Soils of South East England ) shows the soils on the site to be of the Frilsham association. These are described as 'well drained mainly fine loamy soils over chalk, some calcareous and shallow calcareous fine loamy soils in places' (SSEW, 1983). Detailed field examination broadly confirms this, particularly the shallow nature of the soils over chalk in the west of the site.

## 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 2 The majority of the agricultural land on the site has been classified as Grade 2, very good quality land, with soil droughtiness as the main limitation. Soil profiles typically comprise heavy clay loam topsoils, similarly textured upper subsoils which occasionally overlie clay, which in turn overlies chalk. The soils in this mapping unit tend to be deeper on the lower slopes over the chalk, although in the south west of the site the soil observation became impenetrable at a depth of 90 cm. Rooting into the chalk can be related to the soil inspection pit that was dug in the Subgrade 3a mapping unit. Consequently, the droughtiness calculation (taking into account soil textures, structures and the local climatic regime) showed that there was only a slight limitation on the amount of profile available water, which can restrict crop yields on these soils. Furthermore, the soils in this mapping unit showed no evidence of a wetness limitation, being assigned to Wetness Class I, which in turn results in a classification of Grade 2. This is due to a slight workability limitation arising from a combination of the heavy topsoil texture and the local climatic regime. Topsoils with a high clay content take longer to return to a workable state after wetting, than those of a lighter texture. Consequently, there is a restriction on the number of days that this land can be worked effectively with agricultural machinery.

5.4 Subgrade 3a A small area of land (0.5 ha.) in the west of the site has been classified as Subgrade 3a, good quality land, with soil droughtiness as the main limitation. This mapping unit reflects the existence of shallower soils over chalk on the higher slopes on the site. Soil profiles typically comprise heavy clay loam topsoils and subsoils, overlying chalk which occurs at a depth ranging between 40-63 cm. A soil inspection pit (Pit 1) was dug to investigate the rooting depth that occurs into the chalk, in order to assess the droughtiness of these soils. It became evident that rooting in the pit occurred to a depth of 75 cm (12 cm into the chalk). When taking this into consideration along with soil textures, structures and the local climatic regime, the droughtiness calculation showed there to be a moderate restriction on the amount of profile available water. This restricts this land to classification as Subgrade 3a, due to the limiting affect that reduced available water has upon crop yields.

5.5 Grade 4 A small strip of land adjacent to a watercourse in the east of the site has been classified as Grade 4, poor quality land, as it has been judged to be at risk from periodic flooding. The land has not been cultivated, and a flood defence bank has been constructed on the opposite side to protect the industrial units that are situated there. Land that is prone to flooding limits the type of crops that can be grown, and can cause severe damage to established crops, therefore a classification of Grade 4 is more appropriate for this land.

ADAS Ref : 0202/032/94  
MAFF Ref : EL 02/00297

Resource Planning Team  
Guildford Statutory Group  
ADAS Reading

## APPENDIX I

### 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 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 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 <u>or</u> , 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 <u>or</u> , 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 <u>or</u> , 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.

## APPENDIX III

### REFERENCES

- \* British Geological Survey (1971), Sheet No.267, Hungerford, 1:63,360
- \* 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 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  
FKT : 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

FSST : 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 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 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

SOIL PIT DESCRIPTION

Site Name : NEWBURY LP SITE 40 Pit Number : 1P

Grid Reference: SU32906825 Average Annual Rainfall : 752 mm  
Accumulated Temperature : 1409 degree days  
Field Capacity Level : 170 days  
Land Use : Cereals  
Slope and Aspect : 05 degrees E

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 25	HCL	10YR43 00	0	5		
25- 63	HCL	10YR44 00	0	10		MDCSAB
63- 75	CH	10YR71 00	0	7		

Wetness Grade : 2 Wetness Class : I  
Gleying : cm  
SPL : No SPL

Drought Grade : 3A APW : 102mm MBW : 0 mm  
APP : 108mm MBP : 16 mm

FINAL ALC GRADE : 3A  
MAIN LIMITATION : Droughtiness

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SAMPLE NO.	GRID REF	ASPECT USE	GRDNT	GLEYS	--WETNESS--		-WHEAT-		-POTS-		M.REL		EROSN	FROST	CHEM	ALC	COMMENTS
					CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT		
1	SU32906830	CER E	06		1	2	93	-9	100	8	3A					DR 3A	
1P	SU32906825	CER E	05		1	2	102	0	108	16	3A					DR 3A	PIT TO 85
2	SU33006830	CER E	03		1	2	109	7	109	17	2					DR 2	WK ALSO
3	SU32906820	CER E	05		1	2	84	-18	85	-7	3A					DR 3A	
4	SU33006820	CER E	03		1	2	114	12	107	15	2					DR 2	WK ALSO

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED		----STONES----			STRUCT/ CONSIST	SUBS					
				COL	ABUN	CONT	COL.	GLEYS	>2	>6	LITH		TOT	STR	POR	IMP	SPL	CALC
1	0-25	hc1	10YR42 00						0	0	HR	3						
	25-55	c	10YR44 00						0	0	CH	20				M		
	55-67	ch	10YR71 00						0	0	HR	2				M		
1P	0-25	hc1	10YR43 00						0	0	HR	5						
	25-63	hc1	10YR44 00						0	0	CH	10	MDCSAB	FR	M			Y
	63-75	ch	10YR71 00						0	0	HR	7			P			Y
2	0-30	hc1	10YR42 00						2	0	HR	5						
	30-60	hc1	10YR54 00						0	0	HR	10				M		
	60-75	c	75YR56 00						0	0	HR	10				M		
	75-87	ch	10YR71 00						0	0	HR	3				P		
3	0-40	hzc1	10YR43 00						0	0	HR	4						
	40-52	ch	10YR81 00						0	0	HR	3				P		
4	0-30	hc1	10YR43 00						0	0	HR	5						
	30-40	hc1	10YR44 00						0	0	HR	10				M		
	40-90	hc1	10YR44 00						0	0	HR	15				M		