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Chichester District Local Plan
Objector site OSH 51
Land North of Wiston Avenue, Donnington
Agricultural Land Classification
October 1995

Resource Planning Team
Guildford Statutory Group
ADAS Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

CHICHESTER DISTRICT LOCAL PLAN OBJECTOR SITE: OSH 51 LAND NORTH OF WISTON AVENUE, DONNINGTON

INTRODUCTION

1. This summary report presents the findings of a detailed Agricultural Land Classification (ALC) survey on approximately 9 ha of land between Wiston Avenue and the A27 at Donnington, near Chichester, in West Sussex. The survey was carried out in October 1995.
2. The survey was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF), Land Use Planning Unit (Reading), in connection with the Chichester District Local Plan. The survey supersedes any previous survey on this land.
3. The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group of ADAS. 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 all of the agricultural land on the site was under permanent grassland. A small area to the east of the site has been mapped as Non-agricultural as it comprises a recreation ground.

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
3b	8.4	95.5
Non-Agricultural	0.4	4.5
Total survey area	8.4	95.5
Total site area	8.8	100.0

7. The fieldwork was conducted at an average density of approximately 1 boring per hectare. A total of 8 borings and 2 soil inspection pits were described during this survey.
8. All of the agricultural land on this site has been classified as Subgrade 3b, moderate quality land, on the basis of a soil wetness limitation. The profiles generally comprise poorly drained medium to heavy loamy soils which contain shallow slowly permeable layers over gravelly horizons at greater

depth. Both surface water problems and high groundwater levels affect land quality on this site. Care is therefore needed with the timing of cultivations and stocking if structural damage to the soil is to be avoided.

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
Grid reference	N/A	SU 852 038
Altitude	m. AOD	5
Accumulated Temperature	day°C	1545
Average Annual Rainfall	mm	763
Field Capacity Days	days	156
Moisture Deficit, Wheat	mm	120
Moisture Deficit, Potatoes	mm	117

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 (Climate Grade 1). However, climatic factors do interact with soil properties to influence soil wetness and droughtiness limitations. At this locality the high crop adjusted soil moisture deficits may increase the likelihood of soil droughtiness while the correspondingly low average annual rainfall may decrease the likelihood of soil wetness.

14. Local climatic factors such as exposure or frost risk are not believed to affect the site.

Site

15. The site is flat and low lying, situated at approximately 5m AOD, thus gradient and relief impose no restrictions to agriculture land use.

16. The River Lavant flows along the northern edge of this site but flooding has not been reported in this particular area (NRA, 1995). However, high ground water levels can be expected in most years.

Geology and soils

17. The relevant geological sheet (BGS, 1972) maps all of the site as valley gravel.
18. The most detailed soil information for the site (SSEW, 1967) shows the Parkgate soil series across most of the site. These soils are described as being 'gley soils developed in brickearth. The soils are uniform in character with silt loam texture and weak structure. Soil drainage is generally imperfect but poorly drained soils are widespread. The gleying is mainly due to a high groundwater table in winter but in some soils there may be some slight impedance within the profile.' (SSEW, 1967). In the west of the site a small area of the Binsted soil series has been mapped. These soils are described as 'non-calcareous gley soils developed in flinty silty head. Where the series overlies the Eocene clay at no great depth it is affected by groundwater and occasionally surface seepage.' (SSEW, 1967). Detailed field survey broadly confirms this.

AGRICULTURAL LAND CLASSIFICATION

19. 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.
20. 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 III.

Subgrade 3b

21. All of the agricultural land on this site has been classified as Subgrade 3b (moderate quality). The profiles comprise very slightly flinty (2% by volume) medium clay loam topsoils over slightly to moderately flinty (10-25% by volume) upper subsoils of similar texture. These generally overlie less stony (2-15% flints by volume) heavy clay loam lower subsoils which are slowly permeable at approximately 30-40cm depth. Some profiles become impenetrable over flints (40-55% by volume) at a depth of 40-90cm but this does not affect the overall grade of the land. The shallow slowly permeable horizons impede drainage causing prolonged waterlogging in the soil profile as reflected by common ochreous mottles which are present from the upper subsoil. Groundwater levels in this area are also high for long periods due a combination of the underlying gravel and proximity to the River Lavant. Water logged soils such as these may cause crop germination and growth to be adversely affected. This land has therefore been assessed as Wetness Class IV, Subgrade 3b, despite the locally dry climatic regime. In addition topsoil workability may also limit the timing of cultivations as trafficking by agricultural machinery or grazing by livestock may lead to structural damage if topsoils are too wet.

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SOURCES OF REFERENCE

British Geological Survey (1972) *Sheet No. 317*, Chichester. 1:63360 scale (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 (1967) *Sheet SU 80. Chichester: Soil maps of the West Sussex coastal Plain*.
SSEW: Harpenden.

Soil Survey of England and Wales (1967) *Soils of the West Sussex coastal Plain*.
SSEW: Harpenden.

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 most 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 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 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

SOIL WETNESS CLASSIFICATION

Definitions of Soil Wetness Classes

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six soil wetness classes are identified and are defined in the table below.

Wetness Class	Duration of waterlogging ¹
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years ²
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 90 days but only wet within 40 cm depth for 30 days in most years
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
IV	The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth for 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
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

Assessment of Wetness Class

Soils have been allocated to wetness classes by the interpretation of soil profile characteristics and climatic factors using the methodology described in *Agricultural Land Classification of England and Wales Revised guidelines and criteria for grading the quality of agricultural land* (MAFF 1988)

¹ The number of days is not necessarily a continuous period

² In most years is defined as more than 10 out of 20 years

APPENDIX III

SOIL DATA

Contents

Sample location map

Soil abbreviations - Explanatory Note

Soil Pit Descriptions

Soil boring descriptions (boring and horizon levels)

Database Printout - Horizon Level Information

SOIL PROFILE DESCRIPTIONS EXPLANATORY NOTE

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	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 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	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
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	SLST	soft oolitic or dolimitic limestone
CH	chalk	FSST	soft fine grained sandstone
ZR	soft argillaceous or silty rocks	GH	gravel with non porous (hard) stones
MSST	soft medium grained sandstone	GS	gravel with porous (soft) stones
SI	soft weathered igneous/metamorphic rock		

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 **VC** very 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 **VF** very friable **FR** friable **FM** firm **VM** very firm
EM extremely firm **EH** extremely hard

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 CHICH DLP WISTON AVENUE Pit Number 1P

Grid Reference SU85200390 Average Annual Rainfall 763 mm
 Accumulated Temperature 1545 degree days
 Field Capacity Level 156 days
 Land Use Permanent Grass
 Slope and Aspect degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 28	MCL	10YR42 00	1	2	HR	F				
28- 40	MCL	10YR53 00	0	25	HR	C	MDCSAB	FR	M	
40- 50	HCL	25Y 63 00	0	40	HR	M	WKCSAB	FR	M	
50- 75	HCL	25Y 62 00	0	55	HR	M			M	

Wetness Grade 3B Wetness Class IV
 Gleying 028 cm
 SPL 040 cm

Drought Grade 3B APW 86 mm MBW -31 mm
 APP 90 mm MBP -30 mm

FINAL ALC GRADE 3B
 MAIN LIMITATION Wetness

SOIL PIT DESCRIPTION

Site Name CHICH DLP WISTON AVENUE Pit Number 2P

Grid Reference SU85400390 Average Annual Rainfall 763 mm
 Accumulated Temperature 1545 degree days
 Field Capacity Level 156 days
 Land Use Permanent Grass
 Slope and Aspect degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 30	MCL	10YR43 00	1	2	HR	C				
30- 40	MCL	10YR53 00	0	15	HR	C	MDCSAB	FM	M	
40- 65	HCL	10YR63 00	0	2	HR	M	WKCSAB	FR	M	

Wetness Grade 3B Wetness Class IV
 Gleying 030 cm
 SPL 040 cm

Drought Grade 3A APW 97 mm MBW -20 mm
 APP 106mm MBP -14 mm

FINAL ALC GRADE 38
 MAIN LIMITATION Wetness

SAMPLE NO	GRID REF	ASPECT USE	--WETNESS--		-WHEAT-		-POTS-		M REL		EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS	
			GRDNT	GLEYSPL	CLASS	GRADE	AP	MB	AP	MB						DRT
1	SU85200400	PGR	040	040	4	3B	111	-6	113	-7	3A			WE	3B	I87 HR
1P	SU85200390	PGR	028	040	4	3B	86	-31	90	-30	3B			WE	3B	At Boring 3
2	SU85300400	PGR	030		2	2	142	25	109	-11	3A			WD	2	
2P	SU85400390	PGR	030	040	4	3B	97	-20	106	-14	3A			WE	3B	At Boring 5
3	SU85200390	PGR	040	040	4	3B	69	-48	69	-51	3B			WE	3B	I42 See 1p
4	SU85300390	PGR	0	040	4	3B	85	-32	90	-30	3B			WE	3B	I60 HR
5	SU85400390	PGR	030	040	4	3B	121	4	115	-5	3A			WE	3B	I90 HR
6	SU85200380	PGR	030	030	4	3B	86	-31	88	-32	3B			WE	3B	I55 HR
7	SU85300380	PGR	030	040	4	3B	80	-37	80	-40	3B			WE	3B	I50 See 1p
8	SU85450385	PGR	030	040	4	3B	121	4	115	-5	3A			WE	3B	I90 HR

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED		----STONES-----			STRUCT/ CONSIST	SUBS			SPL	CALC
				COL	ABUN	CONT	COL	GLE	>2	>6	LITH		TOT	STR	POR		
1	0-25	mzc1	10YR43 00						0	0	HR	2		M			
	25-40	mzc1	10YR54 00	10YR58 00	F				0	0	HR	15		M			
	40-60	hzc1	10YR64 00	10YR58 00	C			Y	0	0	HR	2		M		Y	
	60-87	c	10YR63 00	75YR58 00	C		00MN00	00	Y	0	0	HR	2		M		Y
1P	0-28	mc1	10YR42 00	10YR58 00	F				1	0	HR	2					
	28-40	mc1	10YR53 00	10YR58 00	C			Y	0	0	HR	25	MDCSAB	FR	M		
	40-50	hc1	25Y 63 00	75YR58 00	M			Y	0	0	HR	40	WKCSAB	FR	M	Y	Y
	50-75	hc1	25Y 62 00	75YR58 00	M			Y	0	0	HR	55		M	Y	Y	Q Adherent HCL
2	0-30	mc1	10YR42 00						0	0	HR	2					
	30-45	mc1	10YR53 00	10YR58 00	C			Y	0	0	HR	15		M			
	45-65	mc1	10YR62 00	75YR58 00	C			Y	0	0	HR	10		M		Y	Y
	65-120	mc1	10YR62 00	10YR58 00	C			Y	0	0	HR	15		M		Y	Y
2P	0-30	mc1	10YR43 00	10YR58 00	C				S	1	0	HR	2				
	30-40	mc1	10YR53 00	10YR58 00	C		00MN00	00	Y	0	0	HR	15	MDCSAB	FM	M	
	40-65	hc1	10YR63 00	75YR58 00	M		00MN00	00	Y	0	0	HR	2	WKCSAB	FR	M	Y
3	0-30	mc1	10YR42 00						0	0	HR	2					
	30-40	mc1	10YR53 00	10YR58 00	F				0	0	HR	15		M			
	40-42	hc1	25Y 63 00	10YR58 00	C			Y	0	0	HR	35		M		Y	
4	0-28	mc1	10YR42 00	10YR56 00	C				Y	0	0	HR	2				
	28-40	mc1	10YR52 00	10YR58 00	C			Y	0	0	HR	10		M			
	40-60	hzc1	25Y 63 00	75YR58 61	M			Y	0	0	HR	2		P		Y	
5	0-30	mc1	10YR43 00	10YR58 00	C				S	0	0	HR	2				
	30-40	mc1	10YR53 00	10YR58 00	C		00MN00	00	Y	0	0	HR	10		M		
	40-80	hc1	10YR63 00	75YR58 61	M		00MN00	00	Y	0	0	HR	2		M		Y
	80-90	hc1	10YR62 00	75YR58 61	M		00MN00	00	Y	0	0	HR	15		M		Y
6	0-30	mc1	10YR42 00						0	0	HR	2					
	30-40	hc1	10YR53 00	10YR58 00	C		00MN00	00	Y	0	0	HR	15		M		Y
	40-55	hc1	10YR63 00	75YR58 00	C		00MN00	00	Y	0	0	HR	10		M		Y
7	0-30	mc1	10YR42 00						0	0	HR	2					
	30-40	mc1	10YR53 00	10YR58 00	C			Y	0	0	HR	15		M			
	40-50	hc1	25Y 62 00	10YR58 00	C			Y	0	0	HR	15		M		Y	
8	0-30	mc1	10YR42 00						0	0	HR	2					
	30-40	mc1	10YR53 00	10YR58 00	C			Y	0	0	HR	10		M			
	40-78	hc1	10YR63 00	75YR58 00	M		00MN00	00	Y	0	0	HR	2		M		Y
	78-90	hc1	10YR63 00	75YR58 00	M		00MN00	00	Y	0	0	HR	15		M		Y