Chichester District Local Plan
Objector Site OSH 35
Land at Drift Road, Selsey,
West Sussex
Agricultural Land Classification
August 1995

Resource Planning Team
Guildford Statutory Group
ADAS Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

CHICHESTER DISTRICT LOCAL PLAN
OBJECTOR SITE OSH35: LAND AT DRIFT ROAD, SELSEY, WEST SUSSEX.

Introduction

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 6.4 ha of land to the north-east of Drift Road at Selsey in West Sussex. The survey was carried out during August 1995.

2. The survey was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF) Land Use Planning Unit, Reading, in connection with the preparation of the Chichester District Local Plan.

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, the land on the site comprised permanent grassland being grazed by horses.

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 fieldwork was conducted at an average density of 1 boring per hectare. A total of 7 borings and one soil pit were described.

7. All of the land on the site has been classified as Subgrade 3a, good quality land, with soil wetness as the main limitation. Soil profiles typically comprise stoneless medium silty clay loam or silt loam topsoils and upper subsoils which rest upon heavy silty clay loam lower subsoils. Profiles show evidence of a soil wetness problem in the form of gleying from the topsoil. The heavy silty clay loam lower subsoil is poorly structured and slowly permeable, causing a drainage impedance. Such drainage characteristics equate these soils with a resultant classification of Subgrade 3a.

Factors Influencing ALC Grade

Climate

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

9. 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 1: Climatic and altitude data

Factor	Units	Values
Grid reference	N/A	SZ 866 940
Altitude	m, AOD	4
Accumulated Temperature	day°C	1550
Average Annual Rainfall	mm	701
Field Capacity Days	days	141
Moisture Deficit, Wheat	mm	125
Moisture Deficit, Potatoes	mm	123

10. 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.

11. 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.

12. 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 are not believed to adversely affect the site. The site is climatically Grade 1. However, climatic factors do interact with soil factors to influence soil wetness and droughtiness limitations. The proximity to the south coast means that evapotranspiration rates will be relatively high. This fact, combined with the warm prevailing temperature, means that at this locality the soil moisture deficits are very high in a national context. High soil moisture deficits increase the likelihood of soil droughtiness limitations.

Site

13. The site is flat and lies at approximately 4 m AOD.

Geology and soils

14. The published geological information (BGS, 1975) shows the entire site to be underlain by drift deposits of brickearth.

15. The published soils information (SSGB, 1967) maps the soils on the site as the Park Gate Series (deep phase). These soils are described as 'deep, stoneless, silty clay loams with shallow mottling' (SSEW, 1983).

Agricultural Land Classification

16. 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 3a

17. All of the land has been classified as Subgrade 3a land, good quality, because of soil wetness limitations. Topsoils comprise non-calcareous medium silty clay loams and, occasionally, silt loams. These overlie similarly textured permeable upper subsoils. At approximately 40 to 60 cm depth these profiles pass into poorly structured heavy silty clay loam lower subsoils, which occasionally pass into clay at depth. These profiles are stoneless. The lower subsoils are slowly permeable and act to cause imperfect soil drainage conditions, as indicated by gleying from the surface. Consequently, these profiles have been assigned to Wetness Class III (see Appendix II). Such profiles are represented by Pit 1. The interaction between the medium textured topsoils and impeded soil drainage with the prevailing climate acts to restrict the flexibility of cropping, stocking and cultivations. Poorly drained wet soils can inhibit plant growth and rooting, and may be more susceptible to structural damage through trafficking by agricultural machinery or poaching by grazing livestock.

18. Due to the very dry subsoil conditions at the time of survey, some of the auger borings at the edge of the site could not be penetrated below the topsoil. It has been assumed that these auger borings would be similar to those elsewhere on the site.

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SOURCES OF REFERENCE

British Geological Survey (1975) *Sheet No. 332, Bognor, 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 (1967) *Sheets SZ79 and SZ89, Selsey Bill, 1:25,000 and accompanying bulletin 'Soils of the West Sussex Coastal Plain'.*
SSGB: Harpenden.

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

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, 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

FIELD ASSESSMENT OF SOIL WETNESS CLASS

SOIL WETNESS CLASSIFICATION

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.

Definition of Soil Wetness Classes

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.

Soils can be allocated to a wetness class on the basis of quantitative data recorded over a period of many years or by the interpretation of soil profile characteristics, site and climatic factors. Adequate quantitative data will rarely be available for ALC surveys and therefore the interpretative method of field assessment is used to identify soil wetness class in the field. The method adopted here is common to ADAS and the SSLRC.

[1]The number of days specified is not necessarily a continuous period.
[2]'In most years' is defined as more than 10 out of 20 years.

APPENDIX III

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 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. **GLEY/SPL** : 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. **GLEY** : 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 **ST** : strongly developed	**MD** : moderately developed
ped size	**F** : fine **C** : coarse	**M** : medium **VC** : very coarse
ped shape	**S** : single grain **GR** : granular **SAB** : sub-angular blocky **PL** : platy	**M** : massive **AB** : angular blocky **PR** : prismatic

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 appropiate 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 : CHICHESTER DLP OBJ OSH35 Pit Number : 1P

Grid Reference: SZ86509410 Average Annual Rainfall : 701 mm
Accumulated Temperature : 1550 degree days
Field Capacity Level : 141 days
Land Use : Permanent Grass
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 30	MZCL	10YR52 00	0	0		C				
30- 47	MZCL	10YR53 00	0	0		C	MDCSAB	FM	M	
47- 95	HZCL	75YR52 00	0	0		C	MDCPR	FM	P	
95-120	ZC	10YR53 00	0	0		C			P	

Wetness Grade : 3A Wetness Class : III
Gleying :000 cm
SPL :047 cm

Drought Grade : 2 APW : 134mm MBW : 9 mm
APP : 114mm MBP : -9 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Wetness

SAMPLE NO.	GRID REF	ASPECT USE	GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	DRT	M.REL FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT		ALC	COMMENTS
1	SZ86409410	PGR		000		2	2	000	0	000	0					WE		3A	I20SEE1P
1P	SZ86509410	PGR		000	047	3	3A	134	9	114	-9	2				WE		3A	
2	SZ86509410	PGR		000	050	3	3A	133	8	115	-8	2				WE		3A	
3	SZ86609410	PGR		000	045	3	3A	139	14	121	-2	2				WE		3A	
4	SZ86509400	PGR		000	040	3	3A	000	0	000	0					WE		3A	
5	SZ86609400	PGR		000	053	3	3A	000	0	000	0					WE		3A	
6	SZ86709400	PGR		000	060	3	3A	000	0	000	0					WE		3A	
7	SZ86659390	PGR		000		2	2	048	-77	048	-75	4				WE		3A	I25SEE1P

				----MOTTLES-----			PED		----STONES----				STRUCT/	SUBS			
SAMPLE	DEPTH	TEXTURE	COLOUR	COL	ABUN	CONT	COL.	GLEY	>2	>6	LITH	TOT	CONSIST	STR	POR	IMP	SPL	CALC
1	0-20	mzcl	10YR53 00	10YR58 00	C			Y	0	0		0						
1P	0-30	mzcl	10YR52 00	10YR58 00	C			Y	0	0		0						
	30-47	mzcl	10YR53 00	10YR58 62	C			Y	0	0		0	MDCSAB FM	M				
	47-95	hzcl	75YR52 00	10YR68 62	C		00MN00 00	Y	0	0		0	MDCPR FM	P	Y		Y	
	95-120	zc	10YR53 00	10YR68 71	C			Y	0	0		0		P			Y	
2	0-30	mzcl	10YR53 00	10YR58 00	C			Y	0	0		0						
	30-50	mzcl	10YR52 00	10YR58 61	C			Y	0	0		0		M				
	50-120	hzcl	10YR53 00	10YR68 52	C			Y	0	0		0		P			Y	
3	0-26	zl	10YR52 00	10YR58 00	C			Y	0	0	HR	2						
	26-45	mzcl	10YR53 00	10YR58 61	C			Y	0	0		0		M				
	45-120	hzcl	75YR52 54	10YR68 71	C			Y	0	0		0		P			Y	
4	0-30	mzcl	10YR53 00	10YR58 61	C			Y	0	0	HR	5						
	30-40	mzcl	10YR53 00	10YR58 61	C			Y	0	0		0		M				
	40-60	hzcl	10YR53 54	10YR68 00	C			Y	0	0		0		P			Y	
	60-100	c	10YR53 00	10YR68 71	M			Y	0	0		0		P			Y	
5	0-25	zl	10YR53 00	10YR58 00	C			Y	0	0		0						
	25-53	zl	10YR72 00	10YR68 00	C			Y	0	0		0		M				
	53-100	hzcl	10YR53 52	10YR68 71	C			Y	0	0		0		P			Y	
	100-120	c	10YR52 00	10YR68 71	C			Y	0	0		0		P			Y	
6	0-30	mzcl	10YR52 53	10YR58 00	C			Y	0	0		0						
	30-60	mzcl	10YR52 00	10YR58 00	C			Y	0	0		0		M				
	60-100	hzcl	10YR53 00	10YR68 71	C			Y	0	0		0		P			Y	
	100-120	hzcl	10YR52 00	10YR68 00	C			Y	0	0		0		P			Y	
7	0-25	mzcl	10YR53 43	10YR58 00	C			Y	0	0		0						