

**Chichester District Local Plan
Objector Sites
OSH 21 Land at Clappers Lane,
East Wittering, 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
OSH 21: LAND AT CLAPPERS LANE, EAST WITTERING

Introduction

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 11.3 ha of land to the east of East Wittering, near Chichester, 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 Chichester District Local Plan - Objector Sites. The results of this survey supersede previous ALC information for this land.
3. The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group in 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 ground cover was a linseed crop. At the time of survey soil conditions were dry as little rain had fallen for an extended period, because of this not all observations were to full auger depth (120cm).

Summary

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10000; 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
2	1.6	14.2
3a	9.7	85.8
Total site area	11.3	100.0

7. The fieldwork was conducted at an average density of 1 boring per hectare. A total of 12 borings and one soil pit were described.

8. The agricultural land at this site has been classified as Grade 2 (very good quality) and Subgrade 3a (good quality). The principal limitation to land quality is soil wetness. The soils in this area comprise very slightly stony, light and medium silty topsoils over medium silty subsoils. Where slightly heavier lower subsoils occurred, these were found to be slowly permeable. This causes a slight to moderate drainage impedence, dependant on the depth to the slowly permeable layer, and leads to soil wetness limitations. Soil wetness affects plant growth and yield and reduces the opportunities for cultivations and/or grazing without causing structural damage to the soil.

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 standard interpolation procedures (Met. Office, 1989).

Table 2: Climatic and altitude data

Factor	Units	Values
Grid reference	N/A	SZ 810 967
Altitude	m, AOD	5
Accumulated Temperature	day°C	1549
Average Annual Rainfall	mm	705
Field Capacity Days	days	142
Moisture Deficit, Wheat	mm	125
Moisture Deficit, Potatoes	mm	124

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 (ATO, 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. However the location of the site, close to the sea, means it may be regarded as being exposed (Met. Office, 1969), although the intervening urban area is likely to reduce this effect. Frost risk is not considered to affect the site. The site is, however, still regarded as being potentially Grade 1 on the basis of overall climate.

Site

14. The site lies at an altitude of approximately 5 m AOD and is flat overall. Nowhere on the site does gradient, microrelief or flooding affect the agricultural land quality.

Geology and soils

15. The published geological information for the site (BGS, 1964), shows it to be underlain by brickearth as a drift deposit over London Clay.

16. The published soils information for the site (SSGB, 1967) maps the site as Hook and Park Gate Soil Series'. The north of the site is mapped as Hook series with the south as Park Gate. Hook series soils on this site are in the deep phase and are described as, 'deep well drained often stoneless fine silty soils occasionally with slowly permeable subsoils.' (SSGB, 1967). Park Gate series soils on this site are in the deep phase and the shallow phase over loamy pebbly drift. They are described as 'deep stoneless silty soils which are variably affected by groundwater, often with slowly permeable subsoils.' (SSGB, 1967). Soils of these broad types were found on the site.

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 III.

Grade 2

19. Land of very good quality has been mapped towards the north of the site. The principal limitations is soil wetness.

20. Soils in this area commonly comprise a very slightly stony (approximately 2% total v/v flints) non-calcareous silt loam topsoil. This passes to a stoneless, gleyed or slightly gleyed, medium silty clay loam or silt loam upper subsoil horizon. Underlying this is a stoneless, permeable, gleyed, medium silty clay loam lower subsoil from between 50 and 55cm. In the local climate, soils of this nature are placed in Wetness Class II (see Appendix II) and, subsequently, Grade 2 is applied when the medium workability status of the topsoil is taken into account. Soil wetness, in this case due to groundwater, slightly restricts land utilisation in terms of the number of days when machinery cultivations and grazing by livestock can occur without causing structural damage to the soil. Soil wetness also affects plant growth and yield.

Subgrade 3a

21. Land of good quality has been mapped over the remainder of the site, towards the south. In this area soil wetness limitations predominate.

22. The soils in this area commonly comprise a very slightly stony (up to 3% v/v total flints) non-calcareous silt loam or medium silty clay loam topsoil. This passes to a gleyed, occasionally slightly gleyed, stoneless, medium silty clay loam upper subsoil. The lower subsoil which begins from between 40 and 65 cm is a gleyed, slowly permeable (see pit 1, Appendix III), stoneless, heavy silty clay loam. This often occurs to depth (120cm), although occasionally clay occurs from between 70 and 100cm. In the local climate the depth to the slowly permeable layer causes these profiles to be placed in Wetness Class III (see Appendix II) and, subsequently, Subgrade 3a is applied when the medium workability status of the topsoils is taken into account. Subgrade 3a soil wetness restricts land utilisation as detailed above (para. 20), but to a slightly greater degree than land shown as Grade 2.

23 Occasional observations in this unit were of both a slightly better and slightly worse quality. These were of limited extent and as such have not been mapped separately.

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SOURCES OF REFERENCE

British Geological Survey (1964) *Sheet 331, Portsmouth. Solid and Drift Edition. 1:63 360.*
Scale. 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 (1969) *Unpublished Climate data relating to Published ALC Sheet 181, 1:63,360*
Scale. Met. Office: Bracknell.

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

Soil Survey of Great Britain (1967) *Soils Maps of the West Sussex Coastal Plain. 1:25 000.*
Scale. SSGB: Harpenden.

Soil Survey of Great Britain (1967) *Soils of the West Sussex Coastal Plain. Bulletin No. 3.*
SSGB: 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 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. **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 **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 : CHICHESTER CLP OSH21 Pit Number : 1P

Grid Reference: SZ81009680 Average Annual Rainfall : 705 mm
 Accumulated Temperature : 1549 degree days
 Field Capacity Level : 142 days
 Land Use : Linseed
 Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 30	ZL	10YR42 00	0	3	HR					
30- 45	MZCL	10YR53 00	0	0		C	MDCSAB	FM	M	
45- 70	HZCL	10YR52 62	0	0		M	MDCPR	FM	P	

Wetness Grade : 3A Wetness Class : III
 Gleying : 30 cm
 SPL : 45 cm

Drought Grade : APW : mm MBW : 0 mm
 APP : mm MBP : 0 mm

FINAL ALC GRADE : 3A
 MAIN LIMITATION : Wetness

SAMPLE D.	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	SZ81009690	LIN	28		2	2	171	46	135	11	1			WE	2	
1P	SZ81009680	LIN	30	45	3	3A		0		0				WE	3A	PIT 70
2	SZ81109690	LIN	55	75	2	2	166	41	148	24	1			WE	2	SL GLEY 28
3	SZ81009680	LIN	30	45	3	3A		0		0				WE	3A	
4	SZ81109680	LIN	30	55	3	3A	147	22	130	6	2			WE	3A	
5	SZ80909670	LIN	25	45	3	3A	140	15	120	-4	2			WE	3A	
6	SZ81009670	LIN			1	1		0		0				WE	3A	IMP 25 SEE 1P
7	SZ81109670	LIN	60	60	2	2		0		0				WE	2	SL GLEY 30
8	SZ80909660	LIN	30	50	3	3A		0		0				WE	3A	
9	SZ81009660	LIN	25	50	3	3A		0		0				WE	3A	
10	SZ81109660	LIN	25	35	4	3B		0		0				WE	3B	IMP 50 SEE 1P
11	SZ80809650	LIN	25	55	3	3A	142	17	125	1	2			WE	3A	
12	SZ80909650	LIN	25	40	3	3A		0		0				WE	3A	

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED	----STONES----			STRUCT/	SUBS	SPL	CALC
				COL	ABUN	CONT		COL.	GLE	>2				
1	0-28	z1	10YR42 00					0	0	HR	2			
	28-50	mzc1	10YR54 53	10YR56 00	C	00MN00	00	Y	0	0	0	M		
	50-120	mzc1	10YR53 63	10YR58 00	M	00MN00	00	Y	0	0	0	M		
1P	0-30	z1	10YR42 00					0	0	HR	3			
	30-45	mzc1	10YR53 00	10YR56 00	C	00MN00	00	Y	0	0	0	MDCSAB	FM	M
	45-70	hzc1	10YR52 62	10YR58 68	M	00MN00	00	Y	0	0	0	MDCPR	FM	P Y Y
2	0-28	z1	10YR42 00					0	0	HR	2			
	28-55	z1	10YR54 00	10YR56 00	C	00MN00	00	S	0	0	0	M		
	55-75	mzc1	10YR53 52	10YR56 00	C	00MN00	00	Y	0	0	0	M		
	75-120	hzc1	10YR53 52	10YR58 00	M	00MN00	00	Y	0	0	0	P		Y
3	0-30	z1	10YR42 00					0	0	HR	3			
	30-45	mzc1	10YR53 00	10YR56 00	C			Y	0	0	0	M		
	45-80	hzc1	10YR53 00	10YR58 00	M	00MN00	00	Y	0	0	0	P		Y
4	0-30	z1	10YR42 43					0	0		0			
	30-55	mzc1	10YR54 52	10YR56 00	C	00MN00	00	Y	0	0	0	M		
	55-120	hzc1	10YR62 00	10YR58 00	M	00MN00	00	Y	0	0	0	P		
5	0-25	z1	10YR52 42	10YR56 00	F			0	0	HR	3			
	25-45	mzc1	10YR52 00	10YR58 61	C			Y	0	0	0	M		
	45-65	hzc1	10YR53 00	10YR68 00	C	00MN00	00	Y	0	0	0	P		Y
	65-100	hzc1	10YR53 00	10YR68 71	M			Y	0	0	0	P		Y
	100-120	c	10YR53 00	10YR68 71	C			Y	0	0	0	P		Y
6	0-25	z1	10YR52 00					0	0	HR	3			IMP DRY SOIL 25
7	0-30	z1	10YR42 00					0	0	HR	3			
	30-60	mzc1	10YR54 00	10YR56 00	C			S	0	0	0	M		
	60-90	hzc1	10YR53 52	10YR56 00	C			Y	0	0	HR	2	P	Y
8	0-30	mzc1	10YR52 00					0	0	HR	3			
	30-50	mzc1	10YR52 00	10YR58 61	C			Y	0	0	0	M		
	50-70	hzc1	10YR53 00	10YR58 61	C	00MN00	00	Y	0	0	0	P		Y
	70-100	c	10YR53 00	10YR68 00	M	00MN00	00	Y	0	0	0	P		Y
9	0-25	mzc1	10YR52 00					0	0	HR	3			
	25-50	mzc1	10YR52 00	10YR58 61	C			Y	0	0	0	M		
	50-80	hzc1	10YR53 00	10YR58 61	C	00MN00	00	Y	0	0	0	P		Y
10	0-25	mzc1	10YR42 00					0	0	HR	3			
	25-35	mzc1	10YR53 00	10YR56 00	C	00MN00	00	Y	0	0	0	M		
	35-50	hzc1	10YR52 53	10YR58 00	M	00MN00	00	Y	0	0	0	P		Y IMP DRY SOIL 50
11	0-25	z1	10YR52 42	10YR56 00	F			0	0	HR	3			
	25-55	mzc1	10YR52 00	10YR58 00	C			Y	0	0	0	M		
	55-120	hzc1	10YR53 00	10YR68 71	C	00MN00	00	Y	0	0	0	P		Y

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED	----STONES----			STRUCT/	SUBS		
				COL	ABUN	CONT	COL.	GLEY	>2	>6	LITH	TOT	CONSIST	STR
12	0-25	z1	10YR52 00 10YR56 00	F					0	0	0			
	25-40	mzc1	10YR52 00 10YR58 00	C				Y	0	0	0	M		
	40-75	hzc1	10YR53 00 10YR68 00	C			00MN00	00	Y	0	0	P	Y	