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ISLE OF WIGHT UNITARY DEVELOPMENT PLAN
OBJECTOR SITES
Land west of Beatrice Avenue, East Cowes

Agricultural Land Classification
ALC Map and Report

September 1998

Resource Planning Team
Eastern Region
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AGRICULTURAL LAND CLASSIFICATION REPORT

ISLE OF WIGHT UNITARY DEVELOPMENT PLAN - OBJECTOR SITES
LAND WEST OF BEATRICE AVENUE, EAST COWES

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 11.0 ha of land to the west of Beatrice Avenue, to the south of East Cowes on the Isle of Wight. The survey was carried out during September 1998.

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 its statutory input to the Isle of Wight Unitary Development 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 use on the site comprised cereal stubble. A very small area of trees and scrub, in the west of the site, has been classified 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.

7. The fieldwork was conducted at an average density of 1 boring per hectare of agricultural land. In total, 11 borings and one soil pit were described.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
3b	10.9	100.0	99.1
Other Land	0.1	-	1.0
Total surveyed area	10.9	100.0	99.1
Total site area	11.0	-	100.0

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

8. All of the agricultural land on the site has been classified as Subgrade 3b (moderate quality) because of a significant soil droughtiness limitation. The soils, which are derived from plateau gravel deposits, comprise moderately stony medium clay loam topsoils which overlie very stony and heavy textured subsoils. At this locality, these soil characteristics act to impart a soil droughtiness limitation such that this land will have lower and less consistent crop yields. A classification of Subgrade 3b is appropriate.

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	SZ 508 941	SZ 509 944
Altitude	m, AOD	35	46
Accumulated Temperature	day°C (Jan-June)	1523	1510
Average Annual Rainfall	mm	821	826
Field Capacity Days	days	168	168
Moisture Deficit, Wheat	mm	111	109
Moisture Deficit, Potatoes	mm	105	103
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 within this survey area means that there is no overall climatic limitation. However, climatic factors do interact with soil properties to influence soil wetness and soil droughtiness. At this locality, both the soil moisture deficit values and field capacity days are average for this region. No climatic factors, such as exposure or frost risk, are believed to adversely affect the land quality on the site. This site is climatically Grade 1.

Site

14. The survey area lies between approximately 35m and 50m AOD on the west facing upper slopes of the Medina River. The site falls at slopes of between 2-5°. Nowhere on the site do gradient or microrelief adversely affect agricultural land quality.

Geology and soils

15. The published geological information for this area (BGS, 1976) shows the entire site to comprise plateau gravel over Bembridge Marls and Hamstead Beds.

16. The most recent published soils information covering the area (SSEW, 1983) shows most of the site to comprise soils of the Sonning 1 Association. These soils are described as 'Well drained flinty coarse loamy and sandy soils, mainly over gravel. Some coarse loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging.' Along the western edge of the site, soils of the Wickham 4 Association are mapped. The latter are described as 'Slowly permeable seasonally waterlogged fine loamy over clayey and fine silty over clayey soils associated with similar clayey soils, often with brown subsoils.' (SSEW, 1983). Detailed field survey work found soils similar to those of the Sonning 1 Association.

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.

Subgrade 3b

19. The entire site has been classified as Subgrade 3b because of significant soil droughtiness limitations, arising from soils developed in plateau gravel deposits which are permeable and well drained (Wetness Class I). Topsoils comprise non-calcareous medium clay loams which are moderately stony (8-14% flints >2 cm, 0-4% flints >6 cm and 20-34% total flints). Most of the soil profiles proved impenetrable to a soil auger below the topsoil. However, where assessed the upper subsoils were found to comprise medium clay loams which are moderately stony (20-35% total flints). Pit 1 was dug to assess the subsoil conditions in more detail. The latter comprise a heavy clay loam upper subsoil passing into a reddish clay lower subsoil at approximately 50 cm depth. The subsoils in this pit were assessed as very stony (39-51% total flints). In comparison to the fine earth fraction of the soil, flints retain little water available for uptake by crop roots. Consequently, the interaction between the soil characteristics (but in particular the high flint content) and the prevailing climate leads to a restriction in water availability for plants in most years. Consequently, Subgrade 3b is appropriate on the basis of soil droughtiness. This land will be subject to low and inconsistent crop yields.

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SOURCES OF REFERENCE

British Geological Survey (1976) *Sheet Nos. 344 and 345, 1:50,000, Isle of Wight, (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:

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	**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. **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	**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. **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	**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

SAMPLE NO.	GRID REF	USE	ASPECT	GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M.REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1	SZ50909440	STB	W	2			1	1	41	-69	41	-64	4				DR	3B	Impen30 see 1P
2	SZ50709430	STB	W	2			1	1	48	-62	48	-57	4				DR	3B	Impen33 see 1P
3	SZ50809430	STB	W	2			1	1	41	-69	41	-64	4				DR	3B	Impen30 see 1P
4	SZ50909430	STB	W	2			1	1	39	-71	39	-66	4				DR	3B	Impen30 see 1P
5	SZ50809420	STB	SW	3			1	1	50	-60	50	-55	4				DR	3B	Impen35 see 1P
6	SZ50909420	STB	SW	3			1	1	52	-58	52	-53	4				DR	3B	Impen40 see 1P
7	SZ51009420	STB	SW	3			1	1	39	-71	39	-66	4				DR	3B	Impen30 see 1P
8	SZ50809410	STB	SW	4			1	1	43	-67	43	-62	4				DR	3B	Impen30 see 1P
9	SZ50909410	STB	SW	4			1	1	52	-58	52	-53	4				DR	3B	Impen40 see 1P
10	SZ51009410	STB	SW	4			1	1	41	-69	41	-64	4				DR	3B	Impen30 see 1P
11	SZ50909400	STB	SW	5			1	1	41	-69	41	-64	4				DR	3B	Impen30 see 1P
1P	SZ50889426	STB	SW	3			1	1	86	-24	73	-32	3B				DR	3B	Vstony s/soils

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
1	0-30	MCL	10YR32						13	1	HR	25							Imp30 gravelly
2	0-33	MCL	10YR32						12	3	HR	20							Imp33 gravelly
3	0-30	MCL	10YR43						9	1	HR	25							Imp30 gravelly
4	0-30	MCL	10YR43						14	4	HR	30							Imp30 gravelly
5	0-30	MCL	10YR32						8	4	HR	20							
	30-35	MCL	10YR32						0	0	HR	20		M					Imp35 gravelly
6	0-30	MCL	10YR42						8	2	HR	25							
	30-40	MCL	10YR43						0	0	HR	35		M					Imp40 gravelly
7	0-30	MCL	10YR42						12	3	HR	30							Imp30 gravelly
8	0-30	MCL	10YR43						14	0	HR	22							Imp30 gravelly
9	0-30	MCL	10YR43						12	0	HR	20							
	30-40	MCL	75YR44						0	0	HR	20							Imp40 gravelly
10	0-30	MCL	10YR43						12	0	HR	20							Imp30 gravelly
11	0-30	MCL	10YR43						12	0	HR	20							Imp30 gravelly
1P	0-29	MCL	10YR42						12	3	HR	34							Wet sieved
	29-50	HCL	10YR43						0	0	HR	39		M					Wet sieved
	50-120	C	10YR46						0	0	HR	51		M					Wet sieved;Pit 80