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ISLE OF WIGHT UNITARY DEVELOPMENT PLAN
OBJECTOR SITES
Land east of Court Road, Freshwater

Agricultural Land Classification
ALC Map and Report

September 1998

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Eastern Region
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AGRICULTURAL LAND CLASSIFICATION REPORT

ISLE OF WIGHT UNITARY DEVELOPMENT PLAN - OBJECTOR SITES
LAND EAST OF COURT ROAD, FRESHWATER

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 10.6 ha of land to the east of Court Road, at Freshwater 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 permanent pasture. The larger area mapped as 'Other land' comprises residential dwellings; the smaller area comprises scrub.

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, nine borings and one soil pit were described.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
2	4.6	46.0	43.4
3b	5.4	54.0	50.9
Other Land	0.6	-	5.7
Total surveyed area	10.0	100.0	94.3
Total site area	10.6	-	100.0

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

8. Approximately half of the site, typically found on the higher, flatter land, has been classified as Grade 2 (very good quality). The remainder of the site has been classified as Subgrade 3b (moderate quality). All of the profiles on the site suffer from wetness problems to varying degrees. Soil wetness acts to restrict the flexibility of cropping, stocking and cultivations. Typically, medium textured loamy topsoils overlie similar, and occasionally heavier, subsoils. These profiles pass to poorly structured clay which acts to impede soil drainage. The depth to these clay horizons will determine the final ALC grade. Where the clay horizons are shallow, the drainage will be poor and the land is classified as Subgrade 3b. Elsewhere, where they are deeper within the profile, the resulting ALC grade is Grade 2.

9. The Grade 2 land is also equally subject to minor soil droughtiness limitations. The interaction between the soil characteristics and the local climate acts to impart slight soil droughtiness, which may act to slightly lower the level and consistency of crop yields. Discrete areas of the Subgrade 3b land is also restricted by a gradient limitation. Slope measurements of 7.5-8° in the north-east and south-east of the site act to limit the range of agricultural machinery that can be safely and efficiently utilised.

FACTORS INFLUENCING ALC GRADE

Climate

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

11. 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 334 868	SZ 332 867
Altitude	m, AOD	15	20
Accumulated Temperature	day°C (Jan-June)	1553	1547
Average Annual Rainfall	mm	771	771
Field Capacity Days	days	159	159
Moisture Deficit, Wheat	mm	118	118
Moisture Deficit, Potatoes	mm	115	114
Overall climatic grade	N/A	Grade 1	Grade 1

12. 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.

13. 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.

14. 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, the soil moisture deficit values are above average for this region. The likelihood of soil droughtiness problems may therefore be increased. With regard to local climatic factors, frost risk is not believed to adversely affect the land quality on the site.

15. However, unpublished information suggests that this locality may be rather exposed (Met. Office, 1968). At the time of survey, there was no evidence of damage by salt-laden winds to the trees on this site. Given that the site is protected from south-westerly winds by the houses to the north of Summers Lane, it was deemed that there is little or no risk of exposure at this site. All of the land on the site is, therefore, climatically Grade 1.

Site

16. The lowest lying land on the site, which lies at 10m AOD, occurs in the north-east of the site. In the east of the site the land rises through moderately steep slopes towards the highest point of 20 m AOD along the western site boundary. Where slopes of 7.5-8.5° occur, the land can be graded no higher than Subgrade 3b. The remaining areas of the site tend to occupy gently to moderately sloping land, typically in the range of 3-6°. Nowhere on the site does microrelief impose a limitation to land quality.

Geology and soils

17. The published geological information for this area (BGS, 1976) shows the entire site to comprise Osborne and Headon Beds.

18. The most recent published soils information covering the area (SSEW, 1983) shows the entire site to comprise soils of the Bursledon Association. These soils are described as 'Deep fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging associated with deep coarse loamy soils variably affected by groundwater. Some slowly permeable seasonally waterlogged loamy over clayey soils. Landslips and associated irregular terrain locally.' (SSEW, 1983). Detailed field survey work found soils similar to this description.

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 II.

Grade 2

21. The flatter, higher land in the west of the site has been classified as Grade 2 (very good quality). This land is equally limited by minor soil droughtiness and also by minor soil wetness. Topsoils typically comprise non-calcareous medium clay loams which are stoneless or very slightly stony (0-1% flints >2 cm and 0-3% total flints). Subsoils tend to have a similar stone content. Occasionally, subsoils contain higher stone contents (15% total chalk fragments or 30% total flints). Subsoils tend to be variable in texture, arising from interbedded deposits. Typical textures include medium and heavy clay loams, sandy clay loams and medium sandy loams. All of these subsoils are permeable and moderately structured in the upper subsoil layers. In some profiles, these textures extend to at least 120 cm depth. In most profiles, however, poorly structured clay occurs at approximately 70 to 100 cm depth. From Pit 1, which represents such profiles, this clay was found to be slowly permeable. All of these profiles are gleyed within 40 cm and, at this locality, are assessed as moderately well drained (Wetness Class II). The interaction between the medium textured topsoils, drainage characteristics and the prevailing climate means that this land may be subject to minor restrictions on the flexibility of cropping, stocking and cultivations.

22. This land is also equally limited by soil droughtiness. The interaction between the soil characteristics (soil texture, stone content and subsoil structure) and the prevailing climate acts to slightly reduce the amount of soil available water. Consequently, this land may be subject to lower and less consistent crop yields.

Subgrade 3b

23. The eastern and northern parts of the site have been classified as Subgrade 3b (moderate quality). The key limitations are soil wetness/workability and gradient. Where soil wetness is limiting, topsoils comprise calcareous medium clay loams. These overlie permeable, similarly textured or heavy clay loam upper subsoils which pass into slowly permeable clay at 30-42 cm depth. All of these profiles are gleyed from the surface and are poorly drained which, at this locality, equates to Wetness Class IV. The interaction between the medium topsoil textures, poor soil drainage and the local climate means that this land is limited to Subgrade 3b by soil wetness. Soil wetness can adversely affect seed germination and survival and can inhibit the development of a good root system. It also influences the sensitivity of soil to structural damage and is, therefore, a major factor in determining the number of days when cultivation, trafficking or grazing can take place.

24. Where gradient is limiting, slopes in the range of 7.5-8.5° may act to restrict the range of agricultural machinery which can be safely and efficiently used. Such land occurs across discrete areas in the east of the site.

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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 (1968) *Unpublished climate data relating to old series OS 1:63,360 scale Sheet 180.* Met. Office: Bracknell.

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:

Sample location map

Soil abbreviations - explanatory note

Soil pit and soil boring descriptions (boring and horizon levels)

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	--WETNESS-- GLEY	SPL	CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M.REL DRT	EROSN FLOOD	FROST EXP	CHEM DIST	ALC LIMIT		COMMENTS
1	SZ33308700	PGR			68	68	2	2	143	25	115	0	2				WD	2	Nr infil ditch
2	SZ33408700	PGR	S	4	0	30	4	3B		0		0					WE	3B	
3	SZ33508700	PGR			0	42	4	3B		0		0					WE	3B	
4	SZ33308690	PGR	N	3	0	100	2	2	150	32	115	0	2				WD	2	Plastic 100
5	SZ33408690	PGR			0	35	4	3B		0		0					WE	3B	
6	SZ33208680	PGR			25		2	2	159	41	119	4	2				WD	2	
7	SZ33308680	PGR			0	75	2	2	136	18	105	-10	2				WD	2	
8	SZ33408680	PGR	E	6	0		2	2	153	35	115	0	2				WD	2	Juncus Q WC IV
9	SZ33208670	PGR			0	75	2	2	140	22	115	0	2				WD	2	
1P	SZ33308680	PGR	N	3	0	90	2	2	152	34	122	7	2				WD	2	H4 Adherent

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL.	GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC	
1	0-25	MCL	10YR32	10YR56	C	D			0	0		0							Root mottles
	25-40	MCL	10YR54						0	0	CH	15		M				Y	
	40-68	MCL	10YR54	10YR56	C	F		S	0	0	CH	2		M				Y	Sl gleyed
	68-120	C	05Y 63 53	10YR58	M	D		Y	0	0		0		M		Y			
2	0-20	MCL	10YR42	10YR46	C	D		Y	1	0	HR	3						Y	
	20-30	HCL	10YR53	10YR56	C	D		Y	0	0		0		M				Y	Not spl see 1P
	30-80	C	05Y 62	10YR68	M	D		Y	0	0		0		P		Y		Y	
3	0-30	MCL	10YR53	10YR56	C	D		Y	1	0	HR	3						Y	
	30-42	HCL	10YR64	10YR56	C	D		Y	0	0		0		M				Y	Not spl see 1P
	42-80	C	10YR64	10YR56	C	D		Y	0	0		0		P		Y			
4	0-30	MCL	10YR32	10YR58	C	D		Y	0	0		0							
	30-40	MCL	10YR53	10YR56	C	D		Y	0	0		0		M					
	40-60	MSL	10YR63	10YR56	C	D		Y	0	0		0		M					Textd fsl in pit
	60-100	SCL	10YR63	10YR56	M	D		Y	0	0		0		M					Textd hcl in pit
	100-120	C	05Y 53 63	10YR58	C	D		Y	0	0		0		P		Y			
5	0-20	MCL	10YR53	75YR46	C	D		Y	1	0	HR	3						Y	
	20-35	MCL	10YR52	10YR56	C	D		Y	0	0		0		M				Y	
	35-57	C	25Y 62	10YR56	M	D		Y	0	0		0		P		Y			
	57-86	C	10YR52	10YR56	M	D		Y	0	0		0		P		Y			
	86-120	C	25Y 62	10YR56	M	D		Y	0	0		0		P		Y			
6	0-25	MZCL	10YR32						0	0		0							
	25-40	MCL	10YR53	10YR58	C	F		Y	0	0	CH	2		M					
	40-65	MCL	10YR53	10YR56	C	D		Y	0	0		0		M					
	65-105	HCL	10YR53	10YR58	68 M	D		Y	0	0		0		M					Not spl see 1P
	105-120	MSL	10YR53	10YR58	C	D		Y	0	0		0		M					
7	0-18	MCL	10YR42	75YR46	C	D		Y	1	0	HR	3							
	18-48	MCL	10YR52	10YR56	C	D		Y	0	0		0		M				Y	
	48-75	MCL	25Y 64	10YR56	C	D		Y	0	0	HR	30		M					
	75-120	C	05Y 62	10YR68	M	D		Y	0	0		0		P		Y			
8	0-20	MCL	10YR42	10YR46	C	D		Y	0	0		0							
	20-75	MCL	10YR63	10YR56	M	F		Y	0	0	HR	2		M					
	75-120	HCL	10YR63	10YR56	M	F		Y	0	0		0		M					
9	0-22	MCL	10YR53	75YR46	C	D		Y	1	0	HR	3							
	22-57	MCL	05Y 52	10YR78	C	D		Y	0	0		0		M					
	57-75	MCL	25Y 81	10YR78	C	D		Y	0	0		0		M					
	75-120	C	05Y 62	10YR68	M	D		Y	0	0		0		P		Y			
1P	0-28	MCL	10YR42	10YR46	C			Y	0	0	HR	2							
	28-59	FSL	10YR53	10YR56	C	F		Y	0	0	HR	2	MDVCSB	FR	M				
	59-90	HCL	25Y 64	10YR68	58 M	D		Y	0	0		0	MDCPR	FR	M				Porous
	90-120	C	05Y 63	10YR68	M	D		Y	0	0		0	WAVCPR	VM	P	Y		Y	Adherent