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Isle of Thanet Local Plan
Site 9 Updown Farm, Margate
Agricultural Land Classification,
~~Summary Report~~
September 1994

AGRICULTURAL LAND CLASSIFICATION REPORT

ISLE OF THANET LOCAL PLAN SITE 9 UPDOWN FARM, MARGATE

1 Summary

- 1.1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality for a number of sites in the Thanet district of Kent. The work forms part of MAFF's statutory input to the preparation of the Isle of Thanet Local Plan.
- 1.2 Site 9 comprises approximately 33 hectares of land to the north of Westwood Industrial Estate east of Ramsgate Road in Margate east Kent. An Agricultural Land Classification (ALC) survey was carried out during September 1994. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 36 borings and one soil inspection pit were described in accordance with MAFF's revised guidelines and criteria for grading the quality of agricultural land (MAFF 1988). These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose a long term limitation on its use for agriculture.
- 1.3 The work was carried out by members of the Resource Planning Team in the Guildford Statutory Group of ADAS.
- 1.4 At the time of the survey the land use was a mixture of cereal stubble and cauliflowers.
- 1.5 The distribution of grades and subgrades is shown on the attached ALC map and the areas are given in the table below. The map has been drawn at a scale of 1:10,000. It is accurate at this scale but any enlargement would be misleading.

Table 1 Distribution of Grades and Subgrades

Grade	Area (ha)	% of Agricultural Land
2	17.1	51.4
3a	<u>16.2</u>	<u>48.6</u>
Total area of site	33.3	100.0

- 1.6 Appendix I gives a general description of the grades, subgrades and land use categories identified in the survey. The main classes are described in terms of the type of limitation that can occur, the typical cropping range and the expected level and consistency of yield.

1 7 The land surveyed has been classified as a mixture of very good quality Grade 2 and good quality Subgrade 3a. The land is affected by soil droughtiness limitations. Profiles comprise medium and heavy clay loam and silty clay loam soils which occasionally become heavier with depth. The profiles which are derived from Upper Chalk are variably flinty and overlie chalky drift deposits at varying depths. The interaction between these soil properties and the dry climate which occurs at this locality causes soil available water to be insufficient to fully meet crop needs. The degree of restriction depends upon the soil textures, stone contents, structures and depth to underlying chalky deposits and determines the grade.

2 Climate

2 1 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.

2 2 The main parameters used in the assessment of an overall climatic limitation are average annual rainfall as a measure of overall wetness and accumulated temperature (degree days Jan-June) as a measure of the relative warmth of a locality.

2 3 A detailed assessment of the prevailing climate was made by interpolation from a 5km gridpoint dataset (Met Office 1989). The details are given in the table below and these show that there is no overall climatic limitation affecting the site. However, in a regional and national context, the crop adjusted soil moisture deficits are very high at this locality and the field capacity days are very low. These climatic factors respectively increase the likelihood of soil droughtiness limitations and decrease that of soil wetness restrictions.

Table 2 Climatic Interpolation

Grid Reference	TR364688
Altitude (m)	40
Accumulated Temperature (degree days Jan-June)	1442
Average Annual Rainfall (mm)	598
Field Capacity (days)	119
Moisture Deficit Wheat (mm)	128
Moisture Deficit Potatoes (mm)	127
Overall Climatic Grade	1

2 4 No local climatic factors such as exposure or frost risk are believed to affect the site.

3 Relief

3 1 Most of the site is flat and lies at approximately 36 to 40m AOD. The remainder of the site adjacent to the eastern site boundary occupies a relatively broad dry

valley with the lower land lying at about 31m AOD. Nowhere on the site does gradient or relief impose any limitation to the agricultural land quality.

4 Geology and Soil

- 4.1 The relevant geological sheet (BGS 1980) shows the solid geology of the entire site to be that of Upper Chalk. Drift deposits of old and young head brickearth are shown in the area corresponding with the dry valley and also across the western half of the site.
- 4.2 The published Soil Survey map (SSEW 1980) shows argillic brown earths across the majority of the site. These soils are described as silty soils in brickearth associated with loamy soils in Thanet and Woolwich Beds, free drainage, locally with slight impedence (SSEW 1980). The north west of the site is shown as brown calcareous earths which are described as variably chalky and flinty soils in head associated with shallow soils over chalk, free drainage (SSEW 1980).
- 4.3 Detailed field examination found well drained loamy silty and clayey soils overlying weathered chalk and occasionally pure chalk deposits at varying depths.

5 Agricultural Land Classification

- 5.1 Table 1 provides the details of the area measurements for each grade and the distribution of each grade is shown on the attached ALC map.
- 5.2 The location of the soil observation points are shown on the attached sample point map.
- 5.3 Two grades of agricultural land quality have been distinguished on this site arising from two different soil types. Land of good quality is derived from soils overlying very hard chalky drift (which proved impenetrable to a soil auger) from approximately 50 cm depth. Land of very good quality arises from deeper soils with no chalky material within the soil profile. These profiles were impenetrable to a soil auger from approximately 75 cm depth because of slightly flinty hard and dry lower subsoil conditions.

Subgrade 3a

- 5.4 Just under one half of the agricultural land surveyed has been classified as Subgrade 3a good quality because of moderate soil droughtiness limitations. These soils are those developed over chalky material. Profiles typically comprise medium clay loam and occasionally heavy clay loam topsoils. These overlie well drained (Wetness Class I) similarly textured or clay subsoils which sometimes are silty textured (medium or heavy silty clay loams). Topsoils and upper subsoils are non-calcareous and are generally stoneless or very slightly stony containing about 0-5% total flints by volume. However at about 50 to 70 cm depth the soil profile passes into calcareous moderately stony lower subsoils which contain approximately 20 to 35% total chalk fragments by volume. From Pit 1 which represents such profiles it could be seen that the weathered chalk horizon becomes

very hard and compact at about 80 cm depth. However, accounting for the very dry subsoil conditions at the time of survey, it was assumed that crop roots would be able to extract water from the soil profile to a depth of approximately 100 cm. In comparison with a soil matrix, chalk retains less moisture available for uptake by crop roots. Consequently, the interaction between these soil textures, profile stone contents and slightly restricted rooting with the very dry local climate means that there is insufficient water available for crop roots. This will tend to reduce the level and consistency of crop yields and imparts a moderate risk of drought stress for those crops which are grown.

Grade 2

- 5.5 Just over one half of the land surveyed has been classified as Grade 2, very good quality. This land is primarily restricted by minor soil droughtiness limitations, though discrete areas of the site are also subject to slight soil workability limitations. This unit relates to the deeper soils on the site which do not have chalky drift within 75 cm depth. Profiles typically comprise non-calcareous medium and heavy clay loam topsoils over similarly textured or medium or heavy silty clay loam subsoils. Profiles are well drained (Wetness Class I) and are very slightly stony throughout, containing 0.3% total flints by volume. From Pit 1 dug within the Subgrade 3a mapping unit, these subsoils are assumed to be moderately structured. Due to very dry and compact subsoil conditions at the time of survey, the majority of borings proved impenetrable to a soil auger between 70 and 90 cm depth. However, it has been assumed that this impenetrability arises from very dry and slightly flinty lower subsoils. It is thus further assumed that the subsoil resource extends to 120 cm depth and that crop roots would be able to exploit this soil resource. Consequently, in comparison to land classified as Subgrade 3a, these profiles retain more soil available water and are less susceptible to drought stress. The interaction between these soil textures, profile stone contents and moderate subsoil structural conditions with the very dry prevailing local climate causes a slight restriction in the amount of soil profile water available for uptake by crop roots. This minor limitation causes plants to suffer drought stress for all or part of the growing season and crop yields may be slightly lowered as a result. In addition, where heavier topsoils of heavy clay loam occur, then the land is also subject to minor soil workability limitations. This results in slight restrictions on the flexibility of cropping, stocking and cultivations.

ADAS Ref 2012/215/94
MAFF Ref EL20/248

Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1980) Sheet No 274 Ramsgate 1 50 000 Series (solid and drift edition)

MAFF (1988) Agricultural Land Classification of England and Wales Revised guidelines and criteria for grading the quality of agricultural land

Meteorological Office (1989) Climatological Data for Agricultural Land Classification

Soil Survey of England and Wales (1980) Soil Survey Bulletin No 9 Soils of Kent and accompanying maps at 1 250 000

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.

¹The number of days specified is not necessarily a continuous period

²In 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 **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 ISLE OF THANET LP SITE 9 Pit Number 1P

Grid Reference TR36606910 Average Annual Rainfall 598 mm
 Accumulated Temperature 1453 degree days
 Field Capacity Level 119 days
 Land Use
 Slope and Aspect degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 23	MCL	10YR42 00	0	2	HR					
23- 36	MCL	75YR44 00	0	1	HR		MDCSAB	FR	M	
36- 52	MZCL	75YR44 00	0	1	HR		MDCSAB	FR	M	
52-100	HCL	10YR64 00	0	25	CH				M	Y

Wetness Grade 1 Wetness Class I
 Gleying cm
 SPL No SPL

Drought Grade 3A APW 131mm MBW 3 mm
 APP 114mm MBP -13 mm

FINAL ALC GRADE 3A
 MAIN LIMITATION Droughtiness

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	TR36406930	STB			1	2	121	-7	120	-7	3A			DR	2	Imp 85 stone
1P	TR36606910	STB			1	1	131	3	114	-13	3A			DR	3A	Chalky52 Re 1P
2	TR36506930	STB			1	2	93	-35	101	-26	3B			DR	3A	Chalky50 Re 1P
3	TR36406920	STB			1	1	149	21	112	-15	3A			DR	3A	
4	TR36506920	STB			1	1	95	-33	105	-22	3B			DR	3A	Chalky60 Re 1P
5	TR36606920	STB			1	1	93	-35	101	-26	3B			DR	3A	Chalky55 Re 1P
6	TR36406910	VEG			1	1	128	0	118	-9	3A			DR	2	Chalky 90
7	TR36506910	STB			1	1	111	-17	120	-7	3A			DR	2	Imp70 dry
8	TR36606910	STB			1	1	91	-37	97	-30	3B			DR	3A	Chalky55 Re 1P
9	TR36706910	STB	SW	02	1	1	92	-36	99	-28	3B			DR	3A	Chalky55 Re 1P
10	TR36806909	STB	SE	04	1	1	112	-16	121	-6	3A			DR	2	Imp75 dry
11	TR36906910	STB	NW	02	1	2	120	-8	113	-14	3A			DR	3A	Chalky60 Re 1P
12	TR36306900	VEG			1	2	107	-21	121	-6	3B			DR	3A	Imp70 dry
13	TR36406900	STB			1	1	113	-15	119	-8	3A			DR	2	Imp80 dry
14	TR36506900	VEG			1	2	119	-9	117	-10	3A			DR	3A	2/3a dr pots
15	TR36606900	STB			1	1	76	-52	76	-51	4			DR	3B	Chalky 30 Q 3b
16	TR36706900	STB	E	04	1	1	107	-21	121	-6	3B			DR	2	Imp70 dry
17	TR36806900	STB	E	04	1	1	117	-11	121	-6	3A			DR	2	Imp80 dry
18	TR36206891	VEG			1	1	157	29	121	-6	2			DR	2	
23	TR36696890	STB			1	2	120	-8	119	-8	3A			DR	2	Imp85 dry
25	TR36366884	VEG			1	1	108	-20	115	-12	3A			DR	3A	Chalk 75
26	TR36466882	VEG	E	02	1	1	91	-37	96	-31	3B			DR	3A	Chalky45 Re 1P
27	TR36566879	VEG	E	02	1	1	103	-25	116	-11	3B			DR	3A	Chalky68 Re 1P
28	TR36666877	VEG			1	1	61	-67	61	-66	4			DR	4	Chalk 28 Q 4
29	TR36316884	VEG			1	1	147	19	117	-10	2			DR	3A	2/3a dr pots
30	TR36426878	VEG			1	1	119	-9	121	-6	3A			DR	2	Imp85 dry
31	TR36496875	VEG			1	1	157	29	121	-6	2			DR	2	
32	TR36596875	VEG			1	1	94	-34	100	-27	3B			DR	3A	Chalky50 Re 1P
33	TR36336874	VEG			1	1	117	-11	117	-10	3A			DR	3A	2/3a dr pots
34	TR36406870	VEG			1	1	147	19	117	10	2			DR	3A	2/3a dr pots
35	TR36406852	VEG			1	1	106	-22	113	14	3B			DR	3A	Chalky60 Re 1P
36	TR36506850	VEG			1	1	106	-22	114	13	3B			DR	3A	Imp80 dry
37	TR36576862	VEG			1	2	88	-40	92	35	3B			DR	3A	Imp55 dry
38	TR36556881	VEG			1	2	147	19	118	-9	2			DR	2	
39	TR36536885	VEG			1	2	125	-3	120	-7	3A			DR	2	Imp90 dry
40	TR36766895	STB	NE	01	1	1	156	28	119	-8	2			DR	2	
41	TR36686897	STB	SE	02	1	1	153	25	118	-9	2			DR	2	Chalky 105

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----			PED COL	----STONES--			STRUCT/ CONSIST	SUBS			CALC
				COL	ABUN	CONT		GLEY	>2	6		LITH	TOT	STR	
1	0-32	hc1	10YR42 00					0	0	HR	1				
	32-48	hc1	10YR54 00					0	0		0			M	
	48-85	mzc1	10YR54 00					0	0		0			M	Imp 85 stone
1P	0-23	mc1	10YR42 00					0	0	HR	2				
	23-36	mc1	75YR44 00					0	0	HR	1	MDCSAB	FR	M	
	36-52	mzc1	75YR44 00					0	0	HR	1	MDCSAB	FR	M	
	52-100	hc1	10YR64 00					0	0	CH	25			M	Y Hard 80 Q roots 100
2	0-28	hc1	10YR43 00					0	0	HR	1				
	28-42	c	10YR54 00					0	0		0			M	
	42-50	c	10YR54 00					0	0		0			M	
	50-60	c	10YR54 00					0	0	CH	10			M	Y Imp 60 dry/chalky
3	0-25	mc1	10YR43 00					0	0	HR	4				
	25-45	mc1	10YR54 00					0	0	HR	4			M	
	45-65	mc1	10YR54 00					0	0	HR	8			M	
	65-80	msz1	10YR54 00					0	0	HR	8			M	
	80-120	sc1	75YR56 00					0	0	HR	5			M	
4	0-25	mc1	10YR43 00					0	0	HR	3				
	25-40	hc1	10YR54 00					0	0	HR	1			M	
	40-60	c	75YR54 00					0	0	HR	5			M	
	60-65	hzc1	10YR63 00					0	0	CH	30			M	Y Imp 65 dry/chalky
5	0-20	mc1	10YR43 00					0	0	HR	2				
	20-35	hc1	75YR46 00					0	0	HR	2			M	
	35-55	c	75YR56 46					0	0	HR	5			M	
	55-63	hzc1	10YR63 00					0	0	CH	30			M	Y Imp 63 dry/chalky
6	0-32	mc1	10YR42 00					0	0	HR	1				
	32-75	c	10YR54 00					0	0		0			M	
	75-90	c	75YR54 00					0	0		0			M	
	90-100	hzc1	10YR64 00					0	0	CH	10			M	Y Imp 100 dry/chalky
7	0-32	mc1	10YR42 00					0	0	HR	1				
	32-50	hc1	10YR54 00					0	0		0			M	
	50-75	mzc1	10YR54 00					0	0		0			M	Imp 75 hard/dry
8	0-20	mc1	10YR43 00					0	0	HR	2				
	20-55	mc1	10YR44 54					0	0	HR	4			M	
	55-60	mzc1	10YR64 63					0	0	CH	12			M	Y Imp 60 dry/chalky
9	0-20	mc1	10YR43 00					0	0	HR	2				
	20-55	hc1	10YR54 00					0	0	HR	5			M	
	55-62	mzc1	10YR63 00					0	0	CH	35			M	Y Imp 62 dry/chalky
10	0-20	mzc1	10YR43 00					0	0	HR	2				
	20-45	mzc1	10YR54 00					0	0	HR	1			M	
	45-75	mzc1	10YR54 00					0	0	HR	2			M	Imp 75 hard/dry

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED COL	-- -STONES--			STRUCT/ CONSIST	SUBS STR POR	IMP	SPL	CALC
				COL	ABUN	CONT		GLE	>2	>6					
11	0-18	hc1	10YR42 00					0	0	HR	2				
	18-60	hc1	10YR54 00					0	0	HR	2	M			
	60-90	hzc1	10YR54 63					0	0	CH	20	M		Y	Imp 90 dry/chalky
12	0-28	hc1	10YR43 00					0	0	HR	1				
	28-70	mzc1	10YR54 00					0	0		0	M			Imp 70 hard/dry
13	0-28	mc1	10YR42 00					0	0	HR	1				
	28-50	hc1	10YR43 00					0	0		0	M			
	50-70	mzc1	10YR54 00					0	0		0	M			
	70-80	c	75YR44 00					0	0		0	M			Imp 80 hard/dry
14	0-30	hc1	10YR42 00					0	0	HR	2				
	30-60	hc1	10YR54 00					0	0		0	M			
	60-90	c	75YR44 00					0	0	HR	2	M			Imp 90 hard/dry
15	0-25	mc1	10YR43 00					0	0	HR	1				
	25-30	hzc1	10YR54 00					0	0	CH	2	M		Y	
	30-45	hzc1	10YR64 00					0	0	CH	20	M		Y	Imp 45 dry/chalky
16	0-28	mc1	10YR42 00					0	0	HR	2				
	28-60	hzc1	10YR54 00					0	0		0	M			
	60-70	mzc1	10YR44 00					0	0		0	M			Imp 70 hard/dry
17	0-30	mc1	10YR42 00					0	0	HR	1				
	30-50	hzc1	10YR44 00					0	0		0	M			
	50-80	mzc1	10YR54 00					0	0		0	M			Imp 80 hard/dry
18	0-28	mc1	10YR43 00					0	0	HR	2				
	28-80	mzc1	10YR54 00					0	0		0	M			
	80-120	hzc1	75YR44 00					0	0		0	M			
23	0-30	hc1	10YR42 00					0	0	HR	2				
	30-48	hc1	10YR54 00					0	0	HR	1	M			
	48-85	mzc1	10YR54 00					0	0		0	M			Imp 85 hard/dry
25	0-25	mc1	10YR42 00					0	0	HR	2				
	25-55	mc1	10YR54 00					0	0	HR	1	M			
	55-75	c	75YR44 00					0	0	HR	1	M			
	75-80	ch	10YR81 00					0	0	HR	2	P		Y	Imp 80 hard/dry
26	0-23	mc1	10YR42 00					0	0	HR	2				
	23-40	hc1	10YR54 00					0	0	HR	2	M			
	40-55	hc1	10YR64 00					0	0	CH	25	M		Y	
	55-60	hc1	10YR64 00					0	0	CH	35	M		Y	Imp 60 dry/chalky
27	0-25	mc1	10YR42 00					0	0	HR	2				
	25-50	hc1	10YR54 00					0	0	HR	2	M			
	50-68	hzc1	10YR54 00					0	0	HR	4	M			
	68-70	hc1	10YR64 00					0	0	CH	25	M		Y	Imp 70 dry/chalky

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----			PED COL	--STONES--			STRUCT/ CONSIST	SUBS				CALC
				COL	ABUN	CONT		GLEY	>2	>6		LITH	TOT	STR	POR	
28	0-28	mc1	10YR42 00					0	0	HR	2					Y
	28-40	ch	10YR81 00					0	0	HR	2		P			Y Imp 40 dry chalk
29	0-30	mc1	10YR43 00					0	0	HR	2					
	30-80	hc1	10YR54 00					0	0		0		M			
	80-120	c	75YR44 00					0	0		0		M			
30	0-30	mc1	10YR43 00					0	0	HR	2					
	30-70	mzc1	10YR54 00					0	0		0		M			
	70-85	c	75YR44 00					0	0		0		M			Imp 85 hard/dry
31	0-28	mc1	10YR43 00					0	0	HR	2					
	28 60	mzc1	10YR54 00					0	0		0		M			
	60 120	mzc1	10YR64 00					0	0		0		M			
32	0-30	mc1	10YR43 00					0	0	HR	2					
	30-40	hc1	75YR44 00					0	0		0		M			
	40-50	c	75YR44 00					0	0		0		M			
	50-60	hzc1	10YR56 00					0	0	CH	25		M		Y	Imp 60 dry/chalky
33	0-30	mc1	10YR42 00					0	0	HR	2					
	30-55	hc1	10YR54 00					0	0		0		M			
	55-70	c	75YR54 00					0	0		0		M			
	70-90	c	10YR56 00					0	0	CH	25		M		Y	Imp 90 dry/chalky
34	0-30	mc1	10YR42 00					0	0	HR	2					
	30-80	hc1	10YR54 00					0	0		0		M			
	80-120	c	10YR56 00	00MN00	00	C		0	0		0		M			
35	0 20	mc1	10YR42 00					0	0	HR	2					
	20-35	hc1	10YR44 00					0	0	HR	2		M			
	35-60	c	10YR44 00					0	0	HR	2		M			
	60 80	c	10YR44 54					0	0	CH	25		M		Y	Imp 80 dry/chalky
36	0-20	mc1	10YR42 00					0	0	HR	2					
	20-35	mc1	10YR54 00					0	0	HR	1		M			
	35 45	c	75YR44 00					0	0	HR	4		M			
	45 75	c	75YR46 00					0	0	HR	2		M			
	75 80	c	75YR46 00					0	0	HR	5		M			Imp 80 hard/dry
37	0 28	hc1	10YR43 00					0	0	HR	2					
	28-45	hc1	10YR54 00					0	0		0		M			
	45 55	c	75YR44 00					0	0	HR	2		M			Imp 55 hard/dry
38	0-25	hc1	10YR42 00					0	0	HR	2					
	25-55	hc1	10YR54 00					0	0		0		M			
	55-85	hzc1	75YR44 00					0	0		0		M			
	85-120	c	75YR54 00					0	0		0		M			

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES ----			PED COL	----STONES--			STRUCT/ CONSIST	SUBS STR POR IMP SPL CALC	
				COL	ABUN	CONT		GLE	>2	>6			LITH
39	0-28	hc1	10YR42 00					0	0	HR	2		
	28-70	hzc1	10YR54 00					0	0	HR	2	M	
	70-90	hzc1	10YR54 00	10YR56 00	C			S	0	0	HR	2	M
40	0-30	mzc1	10YR42 00					0	0	HR	2		
	30-40	hc1	10YR44 00					0	0	HR	2	M	
	40-80	hc1	10YR54 00					0	0	HR	2	M	
	80-120	mc1	10YR54 00					0	0	CH	3	M	Y
41	0-27	mc1	10YR42 00					0	0	HR	2		
	27-55	hc1	10YR54 00					0	0		0	M	
	55-70	hzc1	10YR54 00					0	0		0	M	
	70-105	mc1	10YR54 00					0	0		0	M	
	105-120	mc1	10YR54 00					0	0	CH	25	M	Y