Cambs 64/92

3.0 ROBBINETTS OPENCAST COAL SITE SOIL REPORT

The site covers an area of 168 ha and is located in Nottinghamshire, approximately 2 km to the east of Ilkeston. Practically all the area is in agricultural use, although nearly half the site has been restored from previous opencast mining.

3.1 SOILS PRESENT

For the purposes of soil handling, the materials present can essentially be considered as 2 main units identifying the areas of previously disturbed land and undisturbed soils. A third smaller unit deliniates areas where significant sandstone is present within the profile, and the buildings at Shortwood Farm are also identified separately.

Details of each unit are presented in the Physical Characteristics report, and summarised below. Physical and chemical analytical data from soils representing the 2 main units are included in Appendices 6-8.

Unit I

This represents the areas affected by previous opencast operations and accounts for 48.7% of the site (82.0 ha). Topsoils are commonly of clay loam or a silty clay loam and depth is variable ranging from 150 mm to 400 mm but averaging approximately 300 mm. Most subsoils are of clay or silty clay to 1,000 mm depth, and often contain coal fragments. In places, grey silty clay overburden is present below 500 mm.

Unit II

This covers 48.5% of the site (81.6 ha) and comprises mainly undisturbed soils developed over Coal Measures Shales and Sandstones.

Topsoils and upper subsoils are of clay loam or silty clay loam. Material of clay or silty clay texture is usually present below about 600 mm in the lower subsoil.

Unit III

This identifies small areas of soils overlying sandstone and accounts for 2.5% of the site (4.3 ha). Topsoils are of silty clay loam or clay loam overlying subsoils ranging from silty clay loam to clay. Fine sand and sandstone are present in the lower subsoils below approximately 800 mm.

Unit IV

This comprises the buildings at Shortwood Farm covering approximately 0.3 ha, with negligible soil reserves.

3.2 SOIL STRIPPING

3.2.1 Areas and Depths

Soil stripping should be based on the units identified in section 1, but some rationalisation is possible. Recommendations are listed in Table 1.

Table 1.

SUMMARY OF SOIL STRIPPING AND STORAGE RECOMMENDATIONS

Unit	Type	Depth (mm)	Main Texture	Notes
I	Topsoil	0-300*	CL	
II	Topsoil	0-300*	CL	
III	Topsoil	0-300*	CL	May be stripped with Unit I.

*Topsoil depth varies mainly 250-300

Unit	Type	Depth (mm)	Main Texture	Notes
I	Subsoil	300-1000**	C	**Overburden occurs below 500 mm in places so full depth not always recoverable.
II	Upper subsoil	300-500	CL	Upper subsoil generally lighter textured than lower subsoil and so should be kept separate.
II	Lower subsoil	500-1000	C	Lower subsoil may be stripped along with Unit I.
III	Subsoil	300-1000	C	May be stripped with unit I. Sandstone in lower profile may limit stripping depth in places.

Topsoils from Units I and II should be stripped separately as the disturbed soils in Unit I are often contaminated with subsoil and are slightly heavier than Unit II.

Topsoils in the small areas of Unit III, however, may be stripped along with the adjacent areas of Unit I.

The upper subsoil in Unit II is normally lighter textured and of better quality than the lower subsoil, and so it should be stripped separately.

The lower subsoil of Unit II may be stripped along with the subsoil of Units I and III. Sandstone under Unit III may limit the subsoil stripping depth possible in this unit.

To summarise

Topsoil handling:

I, III	Together
II	Separate

Subsoil handling:

I, II Lower, III	Together
II Upper	Separate

3.2.2 Soil Moisture Content

Soils are increasingly susceptible to damage from machinery by compaction and smearing as moisture content increases. Soil movement should only take place at moisture contents below the plastic limit ie when soils are in a dry friable state.

3.2.3 Equipment Movement

Movement of scrapers should take place on as low a strata of soil as possible. The majority of movement should be on material which is not designated as either topsoil or subsoil, and no unnecessary movement should take place on the topsoil.

3.2.4 Soil Making Material

As soils are currently present over practically the whole site, the requirement for additional soil making materials should be minimal.

Some shortage may result form the occurrence of overburden within 1 m depth in parts of Unit I, and from hard shallow sandstone under parts of Unit III.

Other parts of Unit III are underlain by softer sandstone which may provide additional material for soil making. Further sources may be found beneath the existing soils in Unit II, or possibly further down the geological profile. Further investigations would be necessary to establish the presence of these.

3.3 STORAGE

3.3.1 General

Topsoils and subsoils previously identified for separate stripping should be stored separately.

There will be a minimum of 2 types of topsoil mounds:

ie Units I and III
Unit II

and 2 types of subsoil mounds:

ie Units I, II lower and III
Unit II upper

Materials should be stored "like on like" so that topsoil is stripped from beneath subsoil heaps, and subsoil is stripped from beneath overburden mounds. The storage mounds should be as shallow as possible, and compacted by machinery as little as possible. Consideration should be given to progressive restoration if this is feasible, as soil structural damage will be minimised when soils are not stored.

A temporary grass cover should be established on all storage mounds. An established sward will minimise soil erosion and ensure that plant roots will extract surface moisture, maintaining the mounds in a drier condition than if no vegetation were present.

3.3.2 Cultivations for Establishment of a Grass Sward on the Storage Mounds

The cultivations necessary for seedbed preparation will depend on weather conditions, soil moisture content, and the degree of compaction created by placing soil in the mounds. In general, the compact plateau of mounds should be loosened to at least 150 mm with a fixed tine cultivator. Fertiliser should be applied to the surface and cultivated in. The seedbed should be worked to form a fine tilth prior to sowing a grass/clover mixture, followed by a light roll. Side slopes that are too steep to cultivate will have to be manually seeded or hydroseeded.

3.4 SOIL REINSTATEMENT

3.4.1 Soil Distribution and Depth

Land restored to agriculture should be reinstated with 1 m of soil of which at least the top 250 mm is topsoil.

Soils of different quality should be restored in separate areas so that different management regimes can be applied, but unless there are ownership constraints, there is no need for the soil types to be replaced in their original locations. The relative qualities of the different materials are summarised below:

Relative quality	Topsoil	Subsoil
Best	Unit II	Unit II Upper
	Units I and III	Units I, III, Unit II Lower
Worst		Soil making materials

It is recommended that 2 basic qualities of land are reinstated with profiles made up as indicated:

A	B
Unit II Topsoil	Units I and III Topsoil
Unit II Upper subsoil	Units I, III, Unit II Lower subsoil
Units I, III, Unit II Lower subsoil	

3.4.2 Soil Movement

When soils are taken from the store, it is important to ensure that damage does not occur. Soil movement should conform to the criteria presented previously, and care should be taken to eliminate any unnecessary trafficking of subsoil or topsoil.

3.4.3 Soil Loosening

As each layer is replaced, it should be thoroughly subsoiled under dry conditions prior to spreading of the next layer. The compaction during spreading of subsequent layers should be kept to a minimum. The subsoiling should be carried out with a winged tine subsoiler and the spacing between tines should be not more than 1½ times the depth of working. The foot of the subsoiler tine should extend below the surface of the last layer placed, in an attempt to mix and disturb the interface between layers.

3.4.4 Soil Analysis, Fertiliser and Organic Matter Additions

Samples from 0-150 mm depth should be analysed at reinstatement, and lime and fertiliser applied as appropriate to correct deficiencies and promote grass establishment.

On the basis of samples taken prior to stripping (Appendix 6) soils are likely to be low in phosphorus and potassium, and particular attention should be paid to the correction of these at reinstatement.

3.4.5 Grass Establishment and Cultivations

Grass should be established as soon as possible after restoration, and preferably in autumn to allow some growth before winter. The swards should be established according to normal agricultural practice, but particular attention should be paid to the timeliness of cultivations.

3.4.6 Drainage

Contouring of the site should be carried out in conjunction with ADAS to ensure sufficient falls and outlets for drainage schemes. Comprehensive drainage systems should be installed in the reinstated agricultural land at the earliest opportunity.

3.5 FUTURE MANAGEMENT

In order to aid the development of new soil profiles in the reinstated land, very careful management will be essential for a number of years. This will include subsoiling to remove compaction, and aid root penetration and natural soil cracking. Grass or winter cereals are the most suitable crops, but even under these care must be taken to minimise any further soil damage by paying special attention to the timeliness of cultivations, and avoiding trafficking the land or stock grazing under wet conditions. Soil analysis should be checked periodically to ensure any deficiencies in lime, phosphate etc are corrected.

AUGER BORING INFORMATION FOR PROPOSED ROBBINETTS OCC

BORING	HORIZON	TEXTURE	TOP DEPTH	LOWER DEPTH
1	1	hcl	0	35
	2	hcl	35	55
	3	c	55	80
2	1	hcl	0	30
	2	c	30	60
	3	c	60	100
3	1	hcl	0	35
	2	c	35	40
4	1	mcl	0	38
	2	c	38	90
	3	coal	90	100
5	1	mcl	0	35
	2	hcl	35	55
	3	c	55	100
6	1	mcl	0	35
	2	mcl	35	50
	3	hcl	50	100
7	1	mcl	0	28
	2	c	28	45
	3	c	45	60
8	1	hcl	0	29
	2	c	29	80
	3	c	80	100
9	1	mszl	0	33
	2	msst	33	40
10	1	szl	0	40
11	1	mcl	0	27
	2	mcl	27	40
	3	c	40	100
12	1	mcl	0	28
	2	mcl	28	65
	3	scl	65	85
	4	scl	85	100
13	1	hcl	0	33
	2	c	33	90
14	1	hcl	0	28
	2	c	28	70
	3	c	70	100
15	1	mcl	0	39
	2	hcl	39	60

BORING	HORIZON	TEXTURE	TOP DEPTH	LOWER DEPTH
	3	c	60	100
16	1	mcl	0	30
	2	hcl	30	60
17	1	mcl	0	38
	2	hcl	38	58
	3	c	58	100
18	1	hcl	0	30
	2	hcl	30	40
	3	c	40	90
19	1	hcl	0	30
	2	c	30	100
20	1	mcl	0	38
	2	fs	38	50
21	1	mcl	0	39
	2	mcl	39	58
	3	c	58	100
22	1	hcl	0	39
	2	hcl	39	60
	3	c	60	100
23	1	hcl	0	29
	2	c	29	100
24	1	mcl	0	33
	2	c	33	82
	3	c	82	100
25	1	hcl	0	40
	2	c	40	80
	3	zc	80	100
26	1	mcl	0	38
	2	hcl	38	50
	3	c	50	100
27	1	hcl	0	27
	2	c	27	45
	3	coal	45	85
	4	zc	85	100
28	1	mcl	0	39
	2	hcl	39	55
	3	c	55	80
29	1	hcl	0	33
	2	c	33	75
	3	zc	75	100

BORING	HORIZON	TEXTURE	TOP DEPTH	LOWER DEPTH
30	1	hcl	0	30
	2	c	30	100
31	1	hcl	0	29
	2	c	29	70
	3	c	70	100
32	1	hcl	0	25
	2	c	25	70
33	1	mcl	0	48
	2	hcl	48	60
	3	c	60	100
34	1	hcl	0	25
	2	c	25	68
	3	coal	68	100
35	1	hcl	0	39
	2	c	39	100
36	1	hcl	0	20
	2	c	20	70
	3	zc	70	90
37	1	hcl	0	25
	2	c	25	60
	3	c	60	100
38	1	hcl	0	25
	2	c	25	60
	3	zc	60	100
39	1	hcl	0	30
	2	c	30	60
	3	zc	60	100
40	1	hcl	0	33
	2	hcl	33	45
	3	c	45	60
	4	c	60	80
41	1	mcl	0	33
	2	c	33	60
	3	c	60	100
42	1	hcl	0	28
	2	c	28	35
43	1	mcl	0	35
	2	hcl	35	60
	3	c	60	100

BORING	HORIZON	TEXTURE	TOP DEPTH	LOWER DEPTH
44	1	hcl	0	25
	2	c	25	80
	3	zc	80	100
45	1	hcl	0	30
	2	scl	30	60
46	1	hcl	0	29
	2	c	29	78
	3	c	78	80
47	1	hcl	0	29
	2	c	29	100
48	1	hcl	0	30
	2	c	30	60
49	1	hcl	0	29
	2	zc	29	70
50	1	hcl	0	28
	2	c	28	100
51	1	hcl	0	35
	2	c	35	50
	3	c	50	80
52	1	hcl	0	50
	2	c	50	70
53	1	zcl	0	25
	2	c	25	50
	3	zc	50	100
54	1	hcl	0	30
	2	c	30	60
55	1	hcl	0	30
	2	c	30	40
	3	zc	40	80
56	1	mcl	0	29
	2	c	29	70
	3	c	70	100
57	1	hcl	0	33
	2	hcl	33	40
	3	c	40	75
	4	coal	75	100
58	1	mcl	0	38
	2	hcl	38	60

BORING	HORIZON	TEXTURE	TOP DEPTH	LOWER DEPTH
59	1	mcl	0	38
	2	c	38	60
	3	c	60	80
60	1	hcl	0	30
	2	scl	30	80
61	1	hcl	0	28
	2	c	28	100
62	1	hcl	0	27
	2	c	27	100
63	1	hcl	0	35
	2	hcl	35	60
	3	c	60	100
64	1	hcl	0	30
	2	c	30	100
65	1	mcl	0	30
	2	c	30	80
	3	zc	80	100
66	1	mcl	0	30
	2	c	30	60
67	1	hcl	0	30
	2	c	30	60
	3	zc	60	100
68	1	hcl	0	30
	2	c	30	60
69	1	hcl	0	30
	2	c	30	100
70	1	mcl	0	29
	2	c	29	100
71	1	mcl	0	33
	2	c	33	100
72	1	hcl	0	35
	2	coal	35	70
	3	szl	70	100
73	1	mcl	0	29
	2	c	29	50
	3	c	50	55
74	1	hcl	0	25
	2	c	25	50
	3	c	50	100

BORING	HORIZON	TEXTURE	TOP DEPTH	LOWER DEPTH
75	1	hcl	0	20
	2	c	20	60
	3	c	60	100
76	1	hcl	0	30
	2	c	30	78
	3	zc	78	100
77	1	hcl	0	25
	2	c	25	65
	3	zc	65	100
78	1	hcl	0	20
	2	c	20	30
	3	zc	30	80
79	1	hcl	0	20
	2	c	20	50
80	1	mcl	0	15
	2	hcl	15	60
	3	c	60	100
81	1	hcl	0	40
	2	coal	40	100
82	1	hcl	0	30
	2	c	30	80
	3	zc	80	100
83	1	mcl	0	29
	2	c	29	70
84	1	mcl	0	29
	2	c	29	80
85	1	mcl	0	20
	2	c	20	60
86	1	mcl	0	30
	2	c	30	50
	3	c	50	100
87	1	hcl	0	39
	2	zc	39	70
88	1	hcl	0	29
	2	c	29	55
	3	c	55	100
89	1	hcl	0	29
	2	c	29	40
	3	c	40	100

BORING	HORIZON	TEXTURE	TOP DEPTH	LOWER DEPTH
90	1	hcl	0	20
	2	c	20	65
	3	c	65	100
91	1	hcl	0	28
	2	c	28	50
	3	zc	50	90
92	1	hcl	0	20
	2	c	20	50
	3	zc	50	100
93	1	mcl	0	15
	2	zc	15	100
94	1	mcl	0	35
	2	c	35	100
95	1	hcl	0	35
	2	c	35	80
	3	zc	80	100
96	1	mcl	0	35
	2	c	35	60
	3	zc	60	100
97	1	mcl	0	20
	2	hcl	20	30
	3	c	30	70
	4	c	70	90
98	1	mcl	0	29
	2	c	29	50
	3	zc	50	100
99	1	hcl	0	30
	2	c	30	60
100	1	hcl	0	35
	2	c	35	60
101	1	hcl	0	29
	2	c	29	40
	3	c	40	50
102	1	hcl	0	29
	2	c	29	60
103	1	hcl	0	30
	2	c	30	65
	3	c	65	80
	4	scl	80	100

BORING	HORIZON	TEXTURE	TOP DEPTH	LOWER DEPTH
104	1	hcl	0	28
	2	c	28	85
	3	zc	85	100
105	1	hcl	0	28
	2	c	28	55
	3	zc	55	75
107	1	mcl	0	30
	2	c	30	70
	3	zc	70	100
108	1	mcl	0	50
	2	c	50	60
109	1	mcl	0	28
	2	hcl	28	40
110	1	hcl	0	50
111	1	mcl	0	35
	2	c	35	65
	3	c	65	100
112	1	mcl	0	29
	2	c	29	55
	3	c	55	60
113	1	hcl	0	30
	2	c	30	100
114	1	hcl	0	30
	2	c	30	100
115	1	hcl	0	25
	2	hcl	25	50
	3	c	50	100
116	1	mcl	0	33
	2	c	33	50
	3	c	50	100
117	1	mcl	0	39
	2	zc	39	100
118	1	hcl	0	39
	2	c	39	65
	3	c	65	100
119	1	hcl	0	29
	2	c	29	45
	3	c	45	100

BORING	HORIZON	TEXTURE	TOP DEPTH	LOWER DEPTH
120	1	mcl	0	28
	2	c	28	100
121	1	hcl	0	30
	2	c	30	50
	3	c	50	100
122	1	hcl	0	30
	2	c	30	100
123	1	hcl	0	30
	2	c	30	100
124	1	hcl	0	29
	2	c	29	60
125	1	hcl	0	33
	2	c	33	50
126	1	mcl	0	25
	2	hcl	25	70
	3	c	70	100
127	1	mcl	0	35
	2	scl	35	65
	3	c	65	90
128	1	mcl	0	30
	2	c	30	70
	3	zc	70	90
129	1	mcl	0	30
	2	hcl	30	50
	3	c	50	80
	4	zc	80	100
130	1	hcl	0	33
	2	hcl	33	55
	3	c	55	100
131	1	mcl	0	29
	2	hcl	29	45
	3	c	45	100
132	1	mcl	0	29
	2	hcl	29	39
	3	c	39	65
133	1	mcl	0	40
	2	c	40	60
134	1	hcl	0	29
	2	c	29	80

BORING	HORIZON	TEXTURE	TOP DEPTH	LOWER DEPTH
135	1	mcl	0	39
	2	c	39	50
	3	zc	50	55
136	1	hcl	0	29
	2	c	29	70
	3	zc	70	100
137	1	mcl	0	33
	2	c	33	70
	3	c	60	100
138	1	mcl	0	29
	2	hcl	29	39
	3	c	39	50
	4	zc	50	80
139	1	mcl	0	35
	2	c	35	80
140	1	hcl	0	30
	2	c	30	70
141	1	hcl	0	35
	2	zc	35	50
	3	hcl	50	60
142	1	hcl	0	55
	2	coal	55	100
143	1	hcl	0	29
	2	c	29	35
144	1	mcl	0	35
	2	c	35	45
145	1	mcl	0	29
	2	c	29	80
146	1	mcl	0	40
	2	mcl	40	50
	3	c	50	100
147	1	mcl	0	35
	2	mcl	35	40
	3	c	40	100
148	1	hcl	0	35
	2	hcl	35	58
	3	c	58	100
149	1	mcl	0	33
	2	c	33	80

BORING	HORIZON	TEXTURE	TOP DEPTH	LOWER DEPTH
150	1	mcl	0	40
	2	hcl	40	80
	3	c	80	100
151	1	mcl	0	40
	2	mscl	40	60
152	1	mcl	0	40
	2	msl	40	60

AUGER BORING INFORMATION FOR PROPOSED

ROBBINETTS OCC

BORING	HORIZON	TEXTURE	TOP DEPTH	LOWER DEPTH
153	1	hcl	0	45
	2	fscl	45	100
154	1	hcl	0	30
	2	hcl	30	35
	3	c	35	50
	4	c	50	78
	5	c	78	100
155	1	hcl	0	25
	2	c	25	38
	3	c	38	60
	4	c	60	85
	5	fscl	85	100
156	1	hcl	0	20
	2	c	20	35
	3	c	35	70
	4	c	70	110
157	1	c	0	40
	2	c	40	70
	3	c	70	110
158	1	hcl	0	38
	2	hcl	38	46
	3	c	46	90
	4	c	90	100
159	1	hcl	0	48
	2	c	48	62
	3	c	62	85
	4	c	85	100
160	1	hcl	0	25
	2	c	25	100
161	1	c	0	25
	2	c	25	33
	3	c	33	50
	4	c	50	80
	5	c	80	100

BORING	HORIZON	TEXTURE	TOP DEPTH	LOWER DEPTH
162	1	hcl	0	25
	2	c	25	35
	3	c	35	58
	4	c	58	85
	5	c	85	100
163	1	hcl	0	40
	2	c	40	50
	3	c	50	80
164	1	hcl	0	25
	2	c	25	80
	3	c	80	100
165	1	hcl	0	35
	2	c	35	100
166	1	c	0	28
	2	c	28	36
	3	c	36	70
	4	c	70	85
167	1	hcl	0	50
	2	c	50	90
	3	coal dust	90	100

SOIL TEXTURE ABBREVIATIONS

c	-	clay
fs	-	fine sand
hcl	-	heavy clay loam
mcl	-	medium clay loam
msl	-	medium sandy loam
mszl or szl	-	sandy silt loam
msst	-	medium sandstone
zc	-	silty clay

ADAS

PIT DESCRIPTION

APPENDIX 4

Site Name: Robbinetts | Slope: - | ATO: 1350 | MD Wheat: 98

Pit No: 1 | Aspect: - | FCD: 150 | MD Potatoes: 87

Land use: Cereal | Microrelief: - | AAR: 682

Depth (cm)	Texture	Munsell Colour	Gleyed	Mottles Abundance/ Colour	Structure Size/Shape/Grade Consistancy	Slowly Perm Layer	Porosity	Stone Abundance/Type	Plant Roots	Comments
22	HZCL	25Y5/2			Coarse sub angular blocky. moderately well developed			<5%	Many	
75	ZC	10 YR 5/6		Abundant 25Y 7/0	Coarse angular blocky very weakly developed	Y	<0.5		Common between peds fewer within peds	
100 (hole dug to 80) augered to 100	ZC	25Y 6/0		10 YR 6/8	Coarse sub angular blocky very weakly developed	Y	<0.5	-	Few, but roots present to 80 cm	

Wetness Class: IV | Wetness ALC grade: 3b | Ap wheat: - | Drought ALC grade: - | ALC grade:

General Comments: Restored land. Pan at base of topsoil. Coal fragments present throughout subsoil with remains of woody roots. Subsoil contamination of topsoil and coal fragments. Earthworms (3) present.

Ap potatoes -

Main limitation: WETNESS

HZCL - heavy silty clay loam

PIT DESCRIPTION

Site Name: Robbinetts

Pit No: 2

Land use: Grass

Slope: -

Aspect: -

Microrelief: -

ATO: 1350

FCD: 150

AAR: 682

MD Wheat: 98

MD Potatoes: 87

Depth (cm)	Texture	Munsell Colour	Gleyed	Mottles Abundance/ Colour	Structure Size/Shape/Grade Consistancy	Slowly Perm Layer	Porosity	Stone Abundance/Type	Plant Roots	Comments
25	HCL	10 YR 4/2	No		Coarse & sub-angular blocky moderately well developed				Many	
37	HCL	10 YR 5/3		Common 75 YR 4/6	Medium sub-angular blocky weakly developed		<0.5%		Common	
100	ZC	5 Y 6/1		Abundant 75 YR 5/6	Coarse prismatic moderately well developed		<0.5%		Common - fewer below 50 cm	

Wetness Class: IV

Wetness ALC grade: 3b

Ap wheat: -

Ap potatoes -

Drought ALC grade: -

ALC grade: 3b

Main limitation: WETNESS

General Comments: Roots present inside ped faces below 50 cms
Porosity greater than on restored land
stone less than 5% total - small sandstone fragments
and occasional coal fragments present.

HCL - heavy clay loam
ZC - silty clay

PIT DESCRIPTION

Site Name: Robbinetts | Slope: - | ATO: 1350 | MD Wheat: 98

Pit No: 3 | Aspect: - | FCD: 150 | MD Potatoes: 87

Land use: Cereal | Microrelief: - | AAR: 682

Depth (cm)	Texture	Munsell Colour	Gleyed	Mottles Abundance/ Colour	Structure Size/Shape/Grade Consistancy	Slowly Perm Layer	Porosity	Stone Abundance/Type	Plant Roots	Comments
0-28	HCL	10 YR 5/2	No	few manganese concretions & occasional mottles	Well formed coarse angular blocky	NO	0.5%	occasional small stones and coal fragments	many fine roots	straw incorporated in profile
28-60	C	7.5 YR 4/4 7.5 YR 3/0		many manganese concretions	coarse prismatic well developed	Yes	0.5%	occasional rounded quartzite stones	occasional fine roots	water seeping into profile
60+	C			many ochreous		Yes	0.5%	occasional small angular stones and coal fragments	-	disturbed soil?

Wetness Class: IV

Wetness ALC grade: 3b

Ap wheat: -

Drought ALC grade: -

ALC grade: 3b

General Comments:

HCL - heavy clay loam
C - clay

Ap potatoes -

Main limitation: WETNESS

PIT DESCRIPTION

Site Name: ROBBINETTS | Slope: | ATO: 1350 | MD Wheat 98

Pit No: 4 | Aspect: | FCD: 150 | MD Potatoes 87

Land use: | Microrelief: | AAR: 682

Exploratory pit to determine subsoil nature

Depth (cm)	Texture	Munsell Colour	Gleyed	Mottles Abundance/ Colour	Structure Size/Shape/Grade Consistency	Slowly Perm Layer	Porosity	Stone Abundance/Type	Plant Roots	Comments
35	SZL			fine sub-angular blocky: weakly developed					Abundant	
80	FSL with sandstone fragments			Crumb- numerous sandstone fragments up to 4 cm				angular	Common	

Wetness Class: | Wetness ALC grade: | AP Wheat | Drought ALC grade: | ALC Grade

General Comments: Dug to 50cm; augered to 80cm | AP potatoes | Main limitation:

9.3.92 Additional area

PIT DESCRIPTION

Site Name: Robbinetts | Slope: | ATO: 1374 | MD Wheat: 102

Pit No: 5 | Aspect: | FCD: 150 | MD Potatoes: 92

Land use: Grass | Microrelief: | AAR: 667

Depth (cm)	Texture	Munsell Colour	Gleyed	Mottles Abundance/ Colour	Structure Size/Shape/Grade Consistancy	Slowly Perm Layer	Porosity	Stone Abundance/Type	Plant Roots	Comments
0 - 20	HCL	10YR53	Y	75YR58 Common	Strongly developed medium Subangular blocky			Few	Common	
20 - 35	C	10YR5366		75YR58 Many	Strongly developed medium angular blocky firm		<0.5%	Stoneless	Common	
35 - 70	C	10YR6358		10YR61 Many	Weakly developed coarse prismatic firm	Y	<0.5%		Common down ped faces	Coal fragments present
70+	FSCL Sandstone fragments	10YR81 10YR68		10YR61 Common	Weakly developed coarse subangular blocky firm		<0.5%		Occasional fine roots	

Wetness Class: IV

Wetness ALC grade: 3b

Ap wheat:

Drought ALC grade:

ALC grade: 3b

General Comments:

Ap potatoes

Main limitation: Wetness

Chemical Analysis of Topsoils

Unit	pH	Phosphorus		Potassium		Magnesium	
		mg/l	(index)	mg/l	(index)	mg/l	(index)
I	6.7	8	(0)	119	(1)	354	(6)
II	6.0	3	(0)	56	(0)	81	(2)

Phosphorus potassium and magnesium are quoted as milligrammes of available material per litre of soil with the equivalent ADAS index in brackets. These are interpreted as follows:

Index 0	-	v. low
1	-	low
2	-	satisfactory
3 and above	-	high

ADAS

Particle Size Analysis

Unit	Depth (mm)	% in each class 2000-600µ	600-200µ	200-60µ	60-20µ	20-2µ	<2µ	Texture
I	0-300	2	4	10	18	33	33	ZCL
	300-1000	1	2	3	13	35	46	ZC
II	0-300	2	5	14	15	34	30	ZCL
	300-500	2	5	14	20	34	25	ZCL
	500-1000	0	0	1	12	49	38	ZC

Textures are derived from the particle size analyses.

Abbreviations: S - sand
Z - silt
C - clay
L - loam

eg ZCL - silty clay loam

ADAS

Plastic Limit Data

Unit	Depth (mm)	Plastic Limit	% on dry soil Acceptable Moisture Content for Soil Movement
I	0-300	32	29
	300-1000	29	26
II	0-300	35	32
	300-500	29	26
	500-1000	27	24

Soils are increasingly prone to structural damage as moisture content increases. To minimise damage, soil movement should ideally take place at moisture contents well below the plastic limit, and acceptable guide levels for each unit are listed above. There will inevitably be some variation within each unit, and ADAS should be consulted if conditions are at all doubtful.