

PROPOSED A35 CHIDEOCK/MORCOMBELAKE BYPASS, DORSET
 AGRICULTURAL LAND CLASSIFICATION

REPORT OF SURVEY

1. INTRODUCTION

In January 1992 the Resource Planning Group (South West Region) carried out a detailed agricultural land classification survey of the proposed route of the Chideock/Morcombelake bypass in Dorset. The survey was carried out under commercial contract to the Department of Transport.

The survey area for the most part consisted of a 350 metre wide strip along the 8 km proposed bypass route. The total area surveyed was 310 ha. Observations were made by hand auger at 101 sites on a 100 metre grid, except where steeply sloping areas were downgraded due to gradient. Ten pits were dug and described. The classification follows MAFF's revised guidelines and criteria for grading the quality of agricultural land (1988).

The accompanying ALC maps show the distribution of the various grades. The soil pit descriptions are given as an appendix.

2. CLIMATE

Estimates of the relevant climatic variables were obtained by interpolation from a five kilometre grid database. This was done at five points along the route, and the variables are given in Table 1.

Table 1 - Climatic variables

Grid Reference (SY -)	396937	396938	395940	413930	447929
Altitude (m)	190	170	100	133	33
Accumulated Temperature (° days)	1372	1395	1474	1437	1550
Average Annual Rainfall (mm)	947	933	882	903	852
Field Capacity Days (days)	191	189	182	185	177
Moisture Deficit, Wheat (mm)	84	87	98	92	105
Moisture Deficit, Potatoes (mm)	69	74	88	81	98
Best Climatic Grade	2	1	1	1	1

The main parameters used in the assessment of an overall climatic limitation are accumulated temperature and average annual rainfall. The accumulated temperature is a measure of the relative warmth of a locality and the average annual rainfall is a measure of the overall wetness. Both these parameters are related to the altitude, and the values for the survey area show that climate becomes a limiting factor at around 180 m. Above that altitude the best grade possible for a site would be Grade 2 due to a climatic limitation.

One site east of Chideock (Pit No 6) was found to be exposed to the south westerly winds and was downgraded to Grade 2 on exposure. Apart from this, no evidence of any limiting local climatic factor, such as exposure, was found along the route.

The field capacity days determine the influence of climate on soil wetness and workability. The moisture deficits are used in the calculation of the droughtiness limitation.

3. AGRICULTURAL LAND CLASSIFICATION

The overall results of the survey are given in Table 2.

Table 2 - ALC Grades

<u>Grade</u>	<u>Area (ha)</u>	<u>% of Survey Area</u>	<u>% of Agricultural Land</u>
2	16	5	7
3a	55	17	22
3b	119	37	48
4	53	17	22
5	3	1	1
Non Agricultural	30	9	
Urban	36	11	
Agricultural Bldgs	4	1	
Disturbed	3	1	
Open Water	0.5	0.2	

TOTAL	319.5		

Grade 2

The Grade 2 land accounts for 7% of the agricultural area, and is characterised by Pits 3, 5, 6 and 10. It consists of soils with a topsoil texture of medium silty clay loam, overlying a medium or heavy silty clay loam subsoil. The soils are deep, occasionally slightly stoney, and free draining. The Grade 2 land is downgraded to Grade 2 due to the combination of a medium silty clay loam topsoil and 180 days at field capacity leading to a workability limitation.

Grade 3a

Grade 3a land covers 22% of the agricultural area, and is described by Pits 1, 7 and 9. It generally consists of soils with a medium silty clay loam topsoil, with some areas having heavy clay loam topsoils (eg Pit 1). Gleying occurs below 40 cm, but a slowly permeable layer is either absent within 80 cm depth, or occurs below 70 cm. This leads to a wetness class of II and a downgrading to subclass 3a because of wetness.

Grade 3b

3b land is the most extensive along the route, covering 48% of the agricultural area. The land surrounding Bellair Haye at the western extremity of the route is downgraded due to both slopes exceeding 7°, and due to microrelief. Land at the eastern end of the route (Pit 8) has gleying and a slowly permeable layer occurring at about 50 cm depth, which in conjunction with a heavy clay loam topsoil leads to a 3b grade. The remainder of the 3b land is downgraded due to gradients of between 8° and 11°.

Grade 4

Grade 4 land is quite extensive, covering 22% of the agricultural area. The land is downgraded due to slopes of between 12° and 18°.

Grade 5

One area of Grade 5 land was identified. This is an ancient monument, and as such the land is only suitable for grazing purposes.

APPENDIX

Soil Pit Descriptions

SOIL PROFILE DESCRIPTIONS: EXPLANATORY NOTE

(i) TEXTURE:-

Soil texture classes are denoted by the following abbreviations (all Upper case*):

S	Sand
LS	Loamy Sand
SL	Sandy Loam
SZL	Sand Silt Loam
ZL	Silt Loam
MZCL	Medium Silty Clay Loam
MCL	Medium Clay Loam
SCL	Sandy Clay Loam
HZCL	Heavy Silty Clay Loam
HCL	Heavy Clay Loam
SC	Sandy Clay
ZC	Silty Clay
C	Clay

For the sand, loamy sand, sandy loam and sandy silt loam classes the predominant size of sand fraction may be indicated by the use of prefixes, thus:

F	fine (more than $\frac{2}{3}$ of sand less than 0.2 mm)
C	coarse (more than $\frac{1}{3}$ of sand greater than 0.6 mm)
M	medium (less than $\frac{2}{3}$ fine sand and less than $\frac{1}{3}$ coarse sand)

The sub-divisions of clay loam and silty clay loam classes according to clay content are indicated as follows:-

M	medium (less than 27% clay):
H	heavy (27-35% clay)

Other possible texture classes include:

P	Peat
SP	Sandy Peat
LP	Loamy Peat
PL	Peaty Loam
PS	Peaty Sand
MZ	Marine Light Silts

* There are two exceptions to the Upper Case rule:-

- The prefix "Calc" is used to identify naturally calcareous soils containing more than 1% Calcium Carbonate
- For organic mineral soils, the texture of the mineral fraction is prefixed by "Org".

(ii) STRUCTURE:-

Nature and size of structural units are denoted by the following abbreviations:

SAB Subangular Blocky
AB Angular Blocky
P Prismatic

(single grain, granular and platy are not abbreviated)

F Fine
M Medium
C Coarse
VC Very Coarse

eg Weak MSAB = Weakly developed medium subangular blocky

(iii) OTHER

f = few = less than 2% of the matrix or surface described
c = common = 2-20% of the matrix or surface described
m = many = 20-40% of the matrix or surface described
vm = very many = +40% of the matrix or surface described

f = faint = indistinct mottles, evident only on close examination
d = distinct = although not striking, the mottles are readily seen
p = prominent = the mottles are conspicuous, and the mottling is one of the outstanding features of the horizon

gm = grey mottling
om = ochreous mottling

eg cdom = common distinct ochreous mottles

rrc = rusty root channels
ppf = pale ped faces
mn = manganese

st = stones 6 cm
sst = stones 2-6 cm
vsst = stones 2 cm

WC = Wetness Class (use Roman numerals, eg WC IV)
SPL = Slowly Permeable Layer
WT = Water Table
I = Impenetrable if used in Depth Column
IMP = Impenetrable if used in soil profile notes
(IMP 2 x 40 cm = 2 additional borings, both impenetrable at 40 cm)
ASP = Auger Sample Point

CHIDEOCK BYPASS

Pit Number : 12

Grid Reference : SY382 940 Average Annual Rainfall : 882 mm
 Accumulated Temperature : 1474 degree days
 Field Capacity Level : 182 days
 Land Use : Permanent Grass
 Slope and Aspect : 05 degrees NW

HORIZON	TEXTURE	COLOUR	STONES >2	TCT.STONE	MOTTLES	STRUCTURE
0- 20	HCL	10YR43 00	0	2		
20- 28	HCL	10YR53 00	0	10		
28- 38	HZCL	25 Y54 00	0	10		
38- 72	C	10YR62 00	0	10	M	WVCSAB
72- 90	C	25Y 62 00	0	5	M	WVCSAB

Wetness Grade : 3B Wetnesss Class : III
 Gleying : 038 cm
 SPL : 072 cm

Drought Grade : 3A APW : 102 mm MBW : 4 mm
 APP : 100 mm MBP : 12 mm

FINAL ALC GRADE : 3B

MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : CHIDEOCK&MOR'LAKE BYPASS Pit Number : 2P

Grid Reference : SY404 935 Average Annual Rainfall : 882 mm
 Accumulated Temperature : 1474 degree days
 Field Capacity Level : 182 days
 Land Use : Permanent Grass
 Slope and Aspect : 08 degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 25	MZCL	10YR44 00	0	0		
25- 54	HCL	10YR56 00	0	2		MCSAB
54- 80	MCL	10YR46 00	0	2		WCSAB

Wetness Grade : 2 Wetnesss Class : I
 Gleying : 000 cm
 SPL : No SPL

Drought Grade : 2 APW : 126 mm MBW : 28 mm
 APP : 126 mm MBP : 38 mm

FINAL ALC GRADE : 3B
 MAIN LIMITATION : Gradient

SOIL PIT DESCRIPTION

Site Name : CHIDEOCK&MOR'LAKE BYPASS Pit Number : 3P

Grid Reference : SY405 937 Average Annual Rainfall : 882 mm
 Accumulated Temperature : 1474 degree days
 Field Capacity Level : 182 days
 Land Use : Permanent Grass
 Slope and Aspect : 07 degrees S

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 27	MZCL	10YR43 00	0	2		
27- 45	MZCL	10YR54 00	0	10		MDCSAB
45- 80	HCL	10YR46 00	0	25		MDMSAB

Wetness Grade : 2 Wetnesss Class : I
 Gleying : 000 cm
 SPL : No SPL

Drought Grade : 2 APW : 118 mm MBW : 20 mm
 APP : 118 mm MBP : 30 mm

FINAL ALC GRADE : 2
 MAIN LIMITATION : Workability

SOIL PIT DESCRIPTION

Site Name : CHIDEOCK&MOR'LAKE BYPASS Pit Number : 4P

Grid Reference : SY422 932 Average Annual Rainfall : 882 mm
 Accumulated Temperature : 1474 degree days
 Field Capacity Level : 182 days
 Land Use : Cereals
 Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 23	MCL	10YR53 00	0	1		
23- 42	HCL	10YR53 00	0	8	C	
42- 75	HCL	10YR64 00	0	5	M	WCSAB
75- 90	HCL	10YR62 00	0	0	M	MCAB

Wetness Grade : 3B Wetnesss Class : IV
 Gleying : 023 cm
 SPL : 042 cm

Drought Grade : 2 APW : 120 mm MBW : 22 mm
 APP : 112 mm MBP : 24 mm

FINAL ALC GRADE : 3B
 MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : CHIDEOCK&MOR'LAKE BYPASS Pit Number : 5P

Grid Reference : SY410 936 Average Annual Rainfall : 882 mm
Accumulated Temperature : 1474 degree days
Field Capacity Level : 182 days
Land Use : Arable
Slope and Aspect : 03 degrees NE

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 28	MZCL	10YR54 00	0	1		
28- 72	MZCL	10YR56 00	0	0		MDCSAB
72- 85	HZCL	10YR62 00	0	0	C	MDCSAB

Wetness Grade : 2 Wetnesss Class : I
Gleying : 072 cm
SPL : No SPL

Drought Grade : 2 APW : 125 mm MBW : 27 mm
APP : 124 mm MBP : 36 mm

FINAL ALC GRADE : 2
MAIN LIMITATION : Workability

SOIL PIT DESCRIPTION

Site Name : CHIDEOCK&MOR'LAKE BYPASS Pit Number : 6P
Grid Reference : SY435 928 Average Annual Rainfall : 882 mm
Accumulated Temperature : 1474 degree days
Field Capacity Level : 182 days
Land Use :
Slope and Aspect : 05 degrees SW

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 25	MZCL	10YR54 00	0	0		
25- 80	HCL	10YR56 00	0	0		MCSAB

Wetness Grade : 2 Wetnesss Class : I
Gleying : 000 cm
SPL : No SPL
Drought Grade : 2 APW : 118 mm MBW : 20 mm
APP : 120 mm MBP : 32 mm

FINAL ALC GRADE : 2
MAIN LIMITATION : Workability

SOIL PIT DESCRIPTION

Site Name : CHIDEOCK&MOR'LAKE BYPASS Pit Number : 7P
Grid Reference : SY429 928 Average Annual Rainfall : 882 mm
 Accumulated Temperature : 1474 degree days
 Field Capacity Level : 182 days
 Land Use : Cereals
 Slope and Aspect : 05 degrees SW

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 45	MCL	10YR53 00	0	0		
45- 80	MCL	25Y 64 00	0	0	M	MCSAB

Wetness Grade : 3A Wetness Class : II
 Gleying : 045 cm
 SPL : No SPL

Drought Grade : 2 APW : 119 mm MBW : 21 mm
 APP : 121 mm MBP : 33 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Workability

SOIL PIT DESCRIPTION

Site Name : CHIDEOCK&MOR'LAKE BYPASS Pit Number : 8P

Grid Reference : SY448 927 Average Annual Rainfall : 882 mm
Accumulated Temperature : 1474 degree days
Field Capacity Level : 182 days
Land Use : Permanent Grass
Slope and Aspect : 03 degrees NW

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 25	HCL	10YR52 00	0	0	C	
25- 50	HCL	10YR62 00	0	0	M	MCSAB
50- 80	C	10YR64 61	0	0	M	MCP

Wetness Grade : 3B Wetnesss Class : III
Gleying : 000 cm
SPL : 050 cm

Drought Grade : 2 APW : 106 mm MBW : 8 mm
APP : 111 mm MBP : 23 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : CHIDEOCK&MOR'LAKE BYPASS Pit Number : 9P

Grid Reference : SY449 930 Average Annual Rainfall : 882 mm
 Accumulated Temperature : 1474 degree days
 Field Capacity Level : 182 days
 Land Use : Arable
 Slope and Aspect : 02 degrees S

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 25	MZCL	10YR44 00	0	0		
25- 45	MZCL	10YR54 00	0	0	F	MDCSAB
45- 55	MZCL	10YR64 00	0	0	C	MDCSAB
55- 85	HCL	10YR62 00	0	0	C	MDMPR

Wetness Grade : 3A Wetnesss Class : III
 Gleying : 045 cm
 SPL : 055 cm

Drought Grade : 2 APW : 125 mm MBW : 27 mm
 APP : 123 mm MBP : 35 mm

FINAL ALC GRADE : 3A
 MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : CHIDEOCK&MOR'LAKE BYPASS Pit Number : 10P

Grid Reference : SY446 930 Average Annual Rainfall : 882 mm
 Accumulated Temperature : 1474 degree days
 Field Capacity Level : 182 days
 Land Use : Permanent Grass
 Slope and Aspect : 03 degrees NW

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 30	MZCL	10YR44 00	0	0		
30- 75	MZCL	10YR54 00	0	0		MDCSAB
75- 95	HCL	10YR52 00	0	0	C	MDCSAB

Wetness Grade : 2 Wetnesss Class : I
 Gleying : 075 cm
 SPL : No SPL

Drought Grade : 1 APW : 136 mm MBW : 38 mm
 APP : 125 mm MBP : 37 mm

FINAL ALC GRADE : 2
 MAIN LIMITATION : Workability

DESCRIPTION OF THE GRADES AND SUBGRADES

The ALC grades and subgrades are described below in terms of the types of limitation which can occur, typical cropping range and the expected level and consistency of yield. In practice, the grades are defined by reference to physical characteristics and the grading guidance and cut-offs for limitation factors in Section 3 enable land to be ranked in accordance with these general descriptions. The most productive and flexible land falls into Grades 1 and 2 and Subgrade 3a and collectively comprises about one-third of the agricultural land in England and Wales. About half the land is of moderate quality in Subgrade 3b or poor quality in Grade 4. Although less significant on a national scale such land can be locally valuable to agriculture and the rural economy where poorer farmland predominates. The remainder is very poor quality land in Grade 5, which mostly occurs in the uplands.

Descriptions are also given of other land categories which may be used on ALC maps.

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 and horticultural crops can usually be grown but on some land in the 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.

Grade 3 – good to moderate quality agricultural land

Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where 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 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 very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

Descriptions of other land categories used on ALC maps

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: golf courses, private parkland, public open spaces, sports fields, allotments and soft-surfaced areas on airports/airfields. 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 land cover types, eg buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will usually be shown.