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Great Torrington

Agricultural Land Classification

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ADAS Bristol

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GREAT TORRINGTON

AGRICULTURAL LAND CLASSIFICATION SURVEY

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GREAT TORRINGTON

AGRICULTURAL LAND CLASSIFICATION SURVEY

INTRODUCTION

1. This report presents the findings of a semi-detailed Agricultural Land Classification (ALC) survey of 249 ha of land at Great Torrington, North Devon. Field survey was based on 121 auger borings and 6 soil profile pits, and was completed in September 1996.

2. The survey was conducted by the Resource Planning Team of ADAS Taunton Statutory Group on behalf of MAFF Land Use Planning Unit in its statutory role in the preparation of Torridge District Local Plan.

3. Information on climate, geology and soils, and from previous ALC survey s was considered and is presented in the relevant section. Apart from the published regional ALC map (MAFF, 1977), which shows the site at a reconnaissance scale as Grade 3 and 4, the site had not been surveyed previously. However, the current survey used the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF, 1988) and supersedes any previous ALC survey. Grade descriptions are summarised in Appendix I.

4. At the time of survey land cover was mainly grass for sheep and beef with a small area of winter cereals and one field of maize. Apart from roads, woodlands and farm buildings, other land which was not surveyed included considerable areas which had already been developed for housing, or where construction was currently in progress. This category also includes playing fields, the meat processing factories in the north west of the survey area and a large area of scrub woodland on Torrington Common. An area of 10.4 ha owned by North Devon Meat Ltd was not surveyed because consent for access was not granted.

SUMMARY

5. The distribution of ALC grades is shown on the accompanying 1: 20 000 scale ALC map. The detail of information shown at this scale is appropriate to the intensity of field survey but could be misleading if enlarged or applied to small areas. Areas are summarised in the Table 1.

Table 1: Distribution of ALC grades: Great Torrington

Grade	Area (ha)	% Surveyed Area (191.9 ha)
3a	76.8	40.1
3b	57.5	29.8
4	57.6	30.1
Ag land not surveyed	10.4	
Other land	46.7	
Total site area	249.0	

6. 40.1% of the survey area was found to be best and most versatile. This is shown as Subgrade 3a with moderate limitations due to wetness and workability, although it also includes several scattered borings which were found to be Grade 2. This raises the possibility that small sites within the area shown as Subgrade 3a could, on detailed survey, prove to be mainly Grade 2.

CLIMATE

7. Estimates of climatic variables for this site were derived from the published agricultural climate dataset "Climatological Data for Agricultural Land Classification" (Meteorological Office, 1989) using standard interpolation procedures. Data for key points around the site are given in Table 2 below.

8. Since the ALC grade of land is determined by the most limiting factor present, overall climate is considered first because it can have an overriding influence by restricting land to a lower grade despite more favourable site and soil conditions. Parameters used for assessing overall climate are accumulated temperature, a measure of relative warmth and average annual rainfall, a measure of overall wetness. The results shown in Table 2 indicate that there is an overall climatic limitation which limits the land to Grade 2, although this is found only in small areas of the highest ground, mainly in the north and east of the survey area.

9. Climatic variables also affect ALC grade through interactions with soil conditions. The most important interactive variables are Field Capacity Days (FCD) which are used in assessing soil wetness and potential Moisture Deficits calculated for wheat and potatoes, which are compared with the moisture available in each profile in assessing soil droughtiness limitations. These are described in later sections.

Table 2: Climatic Interpolations: Great Torrington

Grid Reference	SS510201	SS506206	SS500190
Altitude (m)	110	140	70
Accumulated Temperature (day °C)	1472	1437	1518
Average Annual Rainfall (mm)	1042	1057	1025
Overall Climatic Grade	1	2	1
Field Capacity Days	213	216	211
Moisture deficit (mm): Wheat	82	78	87
Potatoes	68	64	75

RELIEF

10. Altitude ranges from 60 metres at Brent Bridge to 140 metres at Coombe Cross with mainly gentle and moderate slops which are not limiting. However, there are significant areas of more strongly sloping land limited to Subgrade 3b and on the sides of the valleys which incise the undulating plateau, moderately steep and steep slopes are found, which although variable are mapped as Grade 4.

11. The underlying geology of the site is shown on the published geology map (IGS, 1980) as Carboniferous Culm measures, mainly sandstone in the south and a mixture of sandstone and shale in the north of the site. This was largely borne out by the current survey, although shattered sandstone and sandstone head was found on the better drained higher ground throughout the site, frequently with no evidence of wetness within 70cm. The sandstone head was found to extend over areas underlain by shale, and where weathered shale was found within the active soil profile, evidence of wetness due to more slowly permeable conditions was normally found also.

12. Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1:250 000 (SSEW, 1983) as mainly Neath Association, with Manod Association on the lower slopes around the western and southern fringes of the site. Neath Association is described as well drained fine loamy soils, often over rock with small patches of similar soils with slowly permeable subsoils and slight seasonal waterlogging. Manod Association is described as well drained fine loamy or fine silty soils over rock, shallow in places. The main part of the survey area is shown as Neath Association and the description of this was largely borne out by the current survey.

AGRICULTURAL LAND CLASSIFICATION

13. The distribution of ALC grades found by the current survey is shown on the accompanying 1: 20 000 scale map and areas are summarised in Table 1. The detail of information shown at this scale is appropriate to the intensity of field survey but could be misleading if enlarged or applied to small areas.

Subgrade 3a

14. Subgrade 3a was found to occupy much of the better drained higher ground, particularly where the parent material was mainly sandstone or sandstone head. Where no evidence of wetness was found within 70 cm, the profile was assessed as Wetness Class I (Appendix II) and the main limitation in such cases was found to be due to restricted workability with heavy clay loam topsoil texture, at least when assessed to 25 cm. This is illustrated by Pits 2 and 5. Both these pits were sited at an auger point which was found the be stony or shallow in order to test the droughtiness limitation in the area. Although Pit 5 shows a moderate droughtiness limitation to Subgrade 3a when calculated to 100cm, Pit 2 did not, despite being sited on an apparently shallow knoll.

15. Topsoil textures throughout the survey area were found on laboratory analysis to be borderline between medium and heavy clay loam, only ranging from 25 to 31 % clay in the samples tested. This range is difficult to distinguish by hand texturing and is hardly significant to workability in practice. Wetness Class I profiles with medium clay loam topsoil texture would be assessed as workability Grade 2 as at several auger points in this survey, even though no Grade 2 is mapped.

16. Subgrade 3a also may be Wetness Class II with either medium or heavy clay loam topsoil textures. Because this survey area whas over 200 Field Capacity Days, gleying alone with no slowly permeable layer (SPL) within 70 cm implies Wetness Class II and therefore a moderate wetness limitation. This illustrated by Pits 1 and 6. It may also apply to borings which were found to be impenetrable and therefore have been recorded as limited only by restricted workability, as the gleyed subsoil can be obscured by the relatively stony and impenetrable upper subsoil.

Subgrade 3b

17. In this survey area this subgrade shows a more serious moderate limitation due to either gradient or wetness. The areas limited by gradient are found throughout the survey area and are frequently adjacent to, and not distinguished from, similar areas limited by wetness.

18. The Subgrade 3a which is limited by wetness may be medium clay loam at Wetness Class IV, or heavy clay loam at Wetness Class III, which was found to be mainly due to gleying within 40 cm in the absence of a slowly permeable layer. Such conditions at this site may be regarded as transitional between Wetness Class I and Wetness Class IV and the mapping unit includes several borings of both Subgrade 3a and Grade 4.

Grade 4

19. Grade 4 with a serious limitation due to gradient was found on the steep valley sides which bisect the undulating plateau. The valley west of Crowbear Farm includes variable slopes locally ranging from Subgrade 3b to Grade 5, although these have been combined into a single Grade 4 mapping unit, as this was considered to be typical and dominant.

20. Large areas, notably at Hatch Moor and at separate areas west of Week and Burwood Farms have a serious limitation due to wetness, Wetness Class IV. Topsoil textures were considered to be mainly heavy clay loam, but as with the rest of the site this is borderline to medium clay loam and such a profile would strictly be graded Subgrade 3b. This situation is illustrated by Pits 3 and 4, were although Pit 3 was found to be Subgrade 3b, it has been included in the Grade 4 mapping unit, from which is largely indistinguishable. In some cases the slowly permeable layer may have limited depth, giving way to weathered shale within the soil profile, similar to the situation illustrated by Pit 4.

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27 September 1996

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APPENDIX I

DESCRIPTION OF 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 include 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 most 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.

Source: MAFF (1988) Agricultural Land Classification of England and Wales Revised Guidelines and Criteria for Grading the Quality of Agricultural Land, MAFF Publications, Alnwick.

APPENDIX II

DEFINITION OF SOIL WETNESS CLASSES

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile.

Wetness Class I

The soil profile is not wet within 70 cm depth for more than 30 days in most years.

Wetness Class 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 not wet within 40 cm depth for more than 30 days in most years.

Wetness Class 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 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 and 90 days in most years.

Wetness Class IV

The soil profile is wet within 70 cm depth for more than 180 days but not within 40 cm depth for more than 210 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.

Wetness Class V

The soil profile is wet within 40 cm depth for 211-335 days in most years.

Wetness Class VI

The soil profile is wet within 40 cm depth for more than 335 days in most years.

Notes: The number of days specified is not necessarily a continuous period.

'In most years' is defined as more than 10 out of 20 years.

Source: Hodgson, J M (In preparation) Soil Survey Field Handbook, Revised Edition.

APPENDIX III

ABBREVIATIONS AND TERMS USED IN SURVEY DATA

Soil pit and auger boring information collected during ALC survey is held on a computer database and is reproduced in this report. Terms used and abbreviations are set out below. These conform to definitions contained in the Soil Survey Field Handbook (Hodgson, 1974).

1. Terms used on computer database, in order of occurrence.

GRID REF: National 100 km grid square and 8 figure grid reference.

LAND USE: At the time of survey

WHT:	Wheat	**SBT:**	Sugar Beet	**HTH:**	Heathland
BAR:	Barley	**BRA:**	Brassicas	**BOG:**	Bog or Marsh
OAT:	Oats	**FCD:**	Fodder Crops	**DCW:**	Deciduous Wood
CER:	Cereals	**FRT:**	Soft and Top Fruit	**CFW:**	Coniferous Woodland
MZE:	Maize	**HRT:**	Horticultural Crops	**PLO:**	Ploughed
OSR:	Oilseed Rape	**LEY:**	Ley Grass	**FLW:**	Fallow (inc. Set aside)
POT:	Potatoes	**PGR:**	Permanent Pasture	**SAS:**	Set Aside (where known)
LIN:	Linseed	**RGR:**	Rough Grazing	**OTH:**	Other
BEN:	Field Beans	**SCR:**	Scrub		

GRDNT: Gradient as estimated or measured by hand-held optical clinometer.

GLEY, SPL: Depth in centimetres to gleying or slowly permeable layer.

AP (WHEAT/POTS): Crop-adjusted available water capacity.

MB (WHEAT/POTS): Moisture Balance. (Crop adjusted AP - crop potential MD)

DRT: Best grade according to soil droughtiness.

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				

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				

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)

MOTTLE COL: Mottle colour using Munsell notation.

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%+

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.

PED. COL: Ped face colour using Munsell notation.

GLEY: If the soil horizon is gleyed a 'Y' will appear in this column. If slightly gleyed, an 'S' will appear.

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 or metamorphic rock		

Stone contents are given in % by volume for sizes >2cm, >6cm and total stone >2mm.

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		

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		

SUBS STR: Subsoil structural condition recorded for the purpose of calculating profile droughtiness: **G:** Good **M:** Moderate **P:** Poor

POR: Soil porosity. If a soil horizon has poor porosity with less than 0.5% biopores >0.5mm, a 'Y' will appear in this column.

IMP: If the profile is impenetrable to rooting a 'Y' will appear in this column at the appropriate horizon.

SPL: Slowly permeable layer. If the soil horizon is slowly permeable a 'Y' will appear in this column.

CALC: If the soil horizon is calcareous with naturally occurring calcium carbonate exceeding 1% a 'Y' will appear this column.

2. Additional terms and abbreviations used mainly in soil pit descriptions.

STONE ASSESSMENT:

VIS:	Visual	**S:**	Sieve	**D:**	Displacement

MOTTLE SIZE:

EF:	Extremely fine <1mm	**M:**	Medium 5-15mm
VF:	Very fine 1-2mm>	**C:**	Coarse >15mm
F:	Fine 2-5mm		

MOTTLE COLOUR: May be described by Munsell notation or as ochreous (OM) or grey (GM).

ROOT CHANNELS: In topsoil the presence of 'rusty root channels' should also be noted.

MANGANESE CONCRETIONS: Assessed by volume

N:	None		**M:**	Many	20-40%
F:	Few	<2%	**VM:**	Very Many	>40%
C:	Common	2-20%			

STRUCTURE: Ped Development *

WA:	Weakly adherent	**M:**	Moderately developed
W:	Weakly developed	**S:**	Strongly developed

POROSITY:

P:	Poor	- less than 0.5% biopores at least 0.5mm in diameter
G:	Good	- more than 0.5% biopores at least 0.5mm in diameter

ROOT ABUNDANCE:

The number of roots per 100cm^2:		Very Fine and Fine	Medium and Coarse
F:	Few	1-10	1 or 2
C:	Common	10.25	2 - 5
M:	Many	25-200	>5
A:	Abundant	>200	

ROOT SIZE

VF:	Very fine	<1mm	**M:**	Medium	2 - 5mm
F:	Fine	1-2mm	**C:**	Coarse	>5mm

HORIZON BOUNDARY DISTINCTNESS:

Sharp:	<0.5cm	**Gradual:**	6 - 13cm
Abrupt:	0.5 - 2.5cm	**Diffuse:**	>13cm
Clear:	2.5 - 6cm		

HORIZON BOUNDARY FORM: Smooth, wavy, irregular or broken.*

* See Soil Survey Field Handbook (Hodgson, 1974) for details.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Torrington	Pit 1 (ASP21/9)	2° S	PGR	Av Rainfall: 1042 mm ATO: 1472 day °C	Culm measures
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 213 Climatic Grade: 1 Exposure Grade: 1	SOIL SAMPLE REFERENCES
25.96	17.9.96	SS 50322019	PB		PB402

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	20	MCL	10YR43	5%HR(VIS)	0	0	-	-	-	-	MF,VF	-	Clear Smooth
2	50	HCL	7.5YR54	10%HR (VIS)	0	F	MM, CSAB	Fm	G	G	CVF	-	Grad. Smooth
3	90+	C	7.5YR64 (7.5YR64)	0	MDMO, FG 7.5YR58,73	F	MCSAB	Vm	M	P (G Fissures)	FVF	-	-

Profile Gleyed From: 50cm

Depth to Slowly Permeable Horizon: -

Wetness Class: II

Wetness Grade: 3a

Available Water Wheat: 147 mm

Potatoes: 123 mm

Moisture Deficit Wheat: 82 mm

Potatoes: 68 mm

Moisture Balance Wheat: +65 mm

Potatoes: +55 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): We

Remarks:

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Torrington	Pit 2 (ASP32)	7° S	CER	Av Rainfall: 1042 mm ATO: 1472 day °C	Culm: sandstone
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 213 Climatic Grade: 1 Exposure Grade: 1	SOIL SAMPLE REFERENCES
25.96	18.9.96	SS 50182001	PB		PB403

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	22	HCL	10YR44	3%> 2cm 12%< 2cm 15% HR (S+D)	0	0	-	-	-	G	MF, VF	-	Grad. Smooth
2	55	HCL	75YR54	20%> 2cm 29%< 2cm 49% HR (S+D)	0	0	MM, FSAB	Fr	G	G	MF, VF	-	Grad. Wavy
3	90+	ZC	10YR64	25%> 2cm 38%< 2cm 63% ZR, HR (S+D)	FFFO 10YR56	0	Too stony	-	(M)	(G)	FVF	-	

Profile Gleyed From: -

Depth to Slowly Permeable Horizon: -

Wetness Class: I

Wetness Grade: 3a

Available Water Wheat: 96 mm

Potatoes: 87 mm

Moisture Deficit Wheat: 82 mm

Potatoes: 68 mm

Moisture Balance Wheat: +14 mm

Potatoes: +19 mm

Droughtiness Grade: 2 (Calculated to 100 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Wk,

Remarks:

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Torrington	Pit 3 (Asp 37)	5°C	PGR	Av Rainfall: 1042 mm ATO: 1472 day °C	Culm shale, sandstone
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 213 Climatic Grade: 1 Exposure Grade: 1	SOIL SAMPLE REFERENCES
25.96	19.9.96	SS 50872000	PB		PB 404

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size,Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	18	MCL	10YR53	0	CDFO 75YR58	0	-	-	-	-	MF, VF	-	Grad. Smooth
2	32	HCL	10YR53	2% HR (VIS)	CDFO 10YR58	0	MC, MSAB	Fr	M	G	CVF	-	Grad. Smooth
3	48	ZC	10YR63	5% HR (VIS)	MDMO 10YR58	F	MCPr	Fm	P	P	FVF	-	-
4	76+	ZC	10YR71	10%SLST, HR (VIS)	MDCO 10YR58	0	WCPr	Fm	P	P	FVF	-	-

Profile Gleyed From: 0cm

Depth to Slowly Permeable Horizon: 32cm

Wetness Class: IV

Wetness Grade: 3b

Available Water Wheat: 124 mm

Potatoes: 101 mm

Moisture Deficit Wheat: 82 mm

Potatoes: 68 mm

Moisture Balance Wheat: +42 mm

Potatoes: +33 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 3b

Main Limiting Factor(s): We

Remarks:

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Torrington	Pit 4 (Asp 74)	2° S	PGR	Av Rainfall: 1042 mm ATO: 1472 day °C FC Days: 213 Climatic Grade: 1 Exposure Grade: 1	Culm shale
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY		SOIL SAMPLE REFERENCES
25.96	20.9.96	SS 50891942	PB		PB 405

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	18	HCL	10YR42	0	CRRC	0	-	-	-	-	MF, VF	-	Grad. Smooth
2	35	HCL	10YR53	5% HR (VIS)	CFFO 10YR56	0	MM, FSAB	Fm	G	G	MF, VF	-	Clear Smooth
3	75	ZC	10YR72 (2.5Y72)	0	MDMO 10YR58	F	MCPr	Vm	P	P (few)	CVF	-	Grad Wavy
4	85+	ZC	N6/	50%ZR (VIS)	CDMO 10YR58	F	Massive with platy stones	Fm	P	P	FVF	-	-

Profile Gleyed From: 0

Depth to Slowly Permeable Horizon: 35cm

Wetness Class: IV

Wetness Grade: 4

Available Water Wheat: 119 mm

Potatoes: 110 mm

Moisture Deficit Wheat: 82 mm

Potatoes: 68 mm

Moisture Balance Wheat: +37 mm

Potatoes: +42 mm

Droughtiness Grade: 1 (Calculated to 100 cm)

Final ALC Grade: 4

Main Limiting Factor(s): We

Remarks:

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Torrington	Pit 5 (Asp 94/102)	4° SW	PGR	Av Rainfall: 1025 mm ATO: 1518 day °C	Culm: hard shale, sandstone
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 211 Climatic Grade: 1	SOIL SAMPLE REFERENCES
25.96	24.9.96	SS50871894	PB	Exposure Grade: 1	PB406

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	15	MCL	10YR43	2%>2cm 11%<2cm 13% HR (S+D)	CRRC	O	-	-	-	-	MF, VF	-	Clear Smooth
2	32	HZCL	10YR44	3%>2cm 11%<2cm 14% HR (S+D)	O	O	MM, FSAB	Fr	G	G	MVF	-	Clear Smooth
3	65	HZCL	10YR54	55%>2cm 21%<2cm 76% HR (S+D)	O	O	Too stony	-	(M)	G	CVF	-	Grad. Smooth
4	80+	ZC	10YR66 64	55%>2cm 21%<2cm 76% HR (S+D)	FDFO 10YR58	O	Too stony	-	(M)	G	FVF	-	-

Profile Gleyed From: -

Depth to Slowly Permeable Horizon: -

Wetness Class: I

Wetness Grade: 3a

Available Water Wheat: 76 mm

Potatoes: 73 mm

Moisture Deficit Wheat: 82 mm

Potatoes: 68 mm

Moisture Balance Wheat: -6 mm

Potatoes: +5 mm

Droughtiness Grade: 3a (Calculated to 100 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Dr

Remarks: TS to 25cm PSD = MCL

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Torrington	Pit 6 (Asp 96)	3° NW	Cer	Av Rainfall: 1025 mm ATO: 1518 day °C	Culm: sandstone
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 211 Climatic Grade: 1 Exposure Grade: 1	SOIL SAMPLE REFERENCES
25.96	25.9.96	SS49051887	PB		PB407

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1(P)	20	MCL	10YR43	5%>2cm 7%<2cm 12% HR (S+D)	O	O	-	-	-	-	MF	-	Absmooth
2	31	HCL	10YR43	As H1	O	O	MC, MSAB	Fr	M	G	MF	-	Clear Smooth
3	43	C	10YR44	12%>2cm 18%<2cm 30% HR (S+D)	O	O	MM, FSAB	Fr	G	G	MVF	-	Clear Smooth
4	60	C	10YR66 74	As H5	CDFO 10YR58	C	WM, FAB (Det by stones)	Fr	M	(G)	FVF	-	Grad Smooth
5	82+	C	10YR66	30%>2cm 26%<2cm 56% HR/SLST (S+D)	FDFO 10YR58	F	WM, FAB (Det by stones)	Fr	M	(G)	FVF	-	-

Profile Gleyed From: 43-60cm

Depth to Slowly Permeable Horizon: -

Wetness Class: II

Wetness Grade: 3a

Available Water Wheat: 90 mm

Potatoes: 86 mm

Moisture Deficit Wheat: 82 mm

Potatoes: 68 mm

Moisture Balance Wheat: +8 mm

Potatoes: +18 mm

Droughtiness Grade: 2 (Calculated to 100 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): We

Remarks: H4 borderline to SPL
Topsoil to 25cm PSD = HCL/MCL