

**BRAMFORD QUARRY, LORAINÉ WAY
BRAMFORD, IPSWICH, SUFFOLK
Agricultural Land Classification
& Site Physical Characteristics
August 1996**

**Resource Planning Team
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AGRICULTURAL LAND CLASSIFICATION REPORT

BRAMFORD QUARRY, BRAMFORD, SUFFOLK.

Introduction

1. This report presents the findings of a detailed, Agricultural Land Classification (ALC) survey of 20.1 ha of land at Bramford, Suffolk. The survey was carried out during August 1996.
2. The survey was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF) Land Use Planning Unit, Cambridge, in connection with an application for mineral extraction.
3. The work was conducted by members of the Resource Planning Team in the Huntingdon Statutory Group in ADAS. The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF, 1988). A description of the ALC grades and subgrades is given in Appendix I.
4. At the time of survey, part of the land was under potatoes, part under post harvest stubble, and a small area left fallow. A small area adjacent to the south western boundary has been classified as other land.

Summary

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10 000 and is accurate at this scale but any enlargement would be misleading.
6. The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1.

Table 1: Areas of grades and other land

Grade/Other land	Area (hectares)	% surveyed
3b	14.9	74.1
4	5.1	25.4
Other land	0.1	0.5
Total agricultural land	20.0	95.5
Total survey area	20.1	100.0

7. The fieldwork was conducted at an average density of 1 boring per hectare. A total of 20 borings and 3 soil pits were described.

8. The majority of the land is of moderate agricultural quality (subgrade 3b), the remainder being of poor agricultural quality (grade 4). Droughtiness is the main limiting factor being more severe in the case of the land mapped as grade 4.

Factors Influencing ALC Grade

Climate

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

10. The key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5km grid datasets using the standard interpolation procedures (Met. Office, 1989).

Table 2: Climatic and altitude data

Parameter	Value
Grid reference	TM 122490
Altitude (m, AOD)	8
Accumulated Temperature (day °C, Jan.–June)	1449
Average Annual Rainfall (mm)	570
Field Capacity Days	103
Moisture Deficit, Wheat (mm)	128
Moisture Deficit, Potatoes (mm)	126
Overall Climatic Grade	1

11. 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.

12. The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR), as a measure of overall wetness, and accumulated temperature (AT0, January to June), as a measure of the relative warmth of a locality.

13. The combination of rainfall and temperature at this site mean there are no overriding climatic limitations to the grading of the land, and therefore the climatic grade 1 is assigned.

Site

14. The site is bounded in the west by the B1113 road at a height of approximately 15m AOD. The land falls gently in an easterly direction to the eastern boundary, part of which comprises the River Gipping, at a height of approximately 8m AOD. The remaining boundaries comprise playing fields, a track and arable farmland. A small area within the flood plain of the River Gipping has a flood risk limitation.

Geology and soils

15. The 1:50 000 scale geology map (BGS, 1990) shows the site to comprise River Terrace deposits (sand and gravel) with a narrow band of Alluvium along the course of the river.

16. The 1:250 000 reconnaissance soil survey map for the area (SSEW, 1983) shows the site to comprise soils of the Ludford Association. The soils are briefly described as being derived from glacialfluvial drift and comprise well drained fine loamy, coarse loamy and sandy soils, locally flinty and in places over gravel.

17. During the current survey one soil type was encountered, but as an extremely stony variant was encountered in the centre of the site the soil resources map shows Type I and Type II. These soil types were well drained and were assessed as Wetness Class I (q.v. Appendix II).

Soil Type I

18. Soil Type I comprises slightly stony, variably calcareous medium sandy loam topsoil over slightly stony, variably calcareous loamy medium sand upper subsoil. A mid-subsoil horizon comprises very slightly stony non-calcareous, loamy medium sand which in turn overlies stoneless non-calcareous medium sand.

Soil Type II

19. Soil Type II comprises non-calcareous, slightly stony, medium sandy loam (occasionally loamy medium sand) topsoil over a non-calcareous, moderately stony loamy medium sand textured upper subsoil. This upper subsoil directly overlies a calcareous, very stony medium sand lower subsoil horizon.

Agricultural Land Classification

20. The details of the classification of the site are shown on the attached ALC map and the area statistics of each grade are given in Table 1, page 1.

21. The location of the auger borings and pits is shown on the attached sample location map and the details of the soils data are presented in Appendix III.

Subgrade 3b

22. The majority of the land has been mapped as subgrade 3b, and is associated with Soil Type I as described in paragraph 18. The coarse loamy over sandy soils have low available water and consequently profiles are significantly droughty and precluded from a higher grade due to droughtiness restrictions. The strip of land (approximately 100m wide) adjacent to the River Gipping is subject to frequent winter flooding of medium duration in length. This flood risk restricts the land to grade 3b.

Grade 4

23. The remainder of the land has been mapped as grade 4, and is associated with Soil Type II as described in paragraph 19. The coarse loamy over sandy soils with increasing stone content in the lower horizons reduces the available water for crop growth and consequently profiles are more significantly droughty than Soil Type I and are precluded from a higher grade due to a severe droughtiness restriction.

Soil Resources

24. Two distinct soil types have been identified within the site and their distribution is shown on the accompanying soil resource map which is illustrative of the soil resources available within the site for restoration purposes but is not a soil stripping map for the site. A statement of the physical characteristics of these two soil types is given in Appendix III. The thicknesses and the volumes given in Table 3 below should be treated with some caution due to the variability of the soils, and also that soils were difficult to auger to 120cm due to the dry conditions and profile stone content.

Table 3 Soil Resources

		Area (ha)	Thickness (cm)	Volume (m ³)
Soil Type I	Topsoil	14.9	33	49170
	Upper Subsoil	14.9	26	38470
	Mid Subsoil	14.9	24	35760
	Lower Subsoil	14.9	37	55130
Soil Type II	Topsoil	5.1	33	16830
	Upper Subsoil	5.1	26	13260
	Lower Subsoil	5.1	61	31110

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SOURCES OF REFERENCE

British Geological Survey (1990). *Sheet No. 207, Ipswich. Scale 1:50 000.*
BGS: London.

Ministry of Agriculture, Fisheries and Food (1988) *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land.* MAFF: London.

Met. Office (1989) *Climatological Data for Agricultural Land Classification.*
Met. Office: Bracknell.

Soil Survey of England and Wales (1983) *Sheet 4. Eastern England. Scale 1:250 000.*
SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in Eastern England*
SSEW: Harpenden

APPENDIX I

DESCRIPTIONS OF THE GRADES AND SUBGRADES

Grade 1: Excellent Quality Agricultural Land

Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly includes top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality.

Grade 2: Very Good Quality Agricultural Land

Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural or horticultural crops can usually be grown but on some land of this grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1 land.

Grade 3: Good to Moderate Quality Land

Land with moderate limitations which affect the choice of crops, the timing and type of cultivation, harvesting or the level of yield. When more demanding crops are grown, yields are generally lower or more variable than on land in Grades 1 and 2.

Subgrade 3a: Good Quality Agricultural Land

Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.

Subgrade 3b: Moderate Quality Agricultural Land

Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass, or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.

Grade 4: Poor Quality Agricultural Land

Land with severe limitations which significantly restrict the range of crops and/or the level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

Grade 5: Very Poor Quality Agricultural Land

Land with severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

APPENDIX II

SOIL WETNESS CLASSIFICATION

Definitions of Soil Wetness Classes

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.

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.

Assessment of Wetness Class

Soils have been allocated to wetness classes by the interpretation of soil profile characteristics and climatic factors using the methodology described in *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land* (MAFF, 1988).

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

² 'In most years' is defined as more than 10 out of 20 years.

APPENDIX III

STATEMENT OF SOIL PHYSICAL CHARACTERISTICS

SOIL TYPE I

Topsoil	Texture	:	medium sandy loam
	Colour	:	10YR4/2, 10YR4/3
	Mottles	:	none
	Concretions	:	none
	Stone	:	7-12%, variable
	Roots	:	many, fine and very fine
	CaCO ₃	:	calcareous
	Depth	:	30/40cm
	Boundary	:	smooth/sharp
	Upper subsoil	Texture	:
Colour		:	10YR4/4, 10YR5/4, 10YR4/6
Mottles		:	none
Concretions		:	none
Stone		:	18-25%, variable
Structure		:	moderately developed, coarse angular blocky
Consistence		:	friable
Structural condition		:	good
Pores		:	>1%
Roots		:	common, fine and very fine
CaCO ₃		:	calcareous
Depth		:	50/65cm
Boundary		:	smooth/gradual
Mid subsoil		Texture	:
	Colour	:	10YR3/4, 10YR5/6, 10YR5/4
	Mottles	:	none
	Concretions	:	none
	Stone	:	4-8%, variable
	Structure	:	single grain
	Consistence	:	loose
	Structural condition	:	moderate
	Pores	:	
	Roots	:	few, fine and very fine
	CaCO ₃	:	slightly calcareous
	Depth	:	75/95cm
	Boundary	:	smooth/gradual

SOIL TYPE I

Lower subsoil	Texture	:	medium sand
	Colour	:	10YR5/4, 10YR7/6, 10YR5/6
	Mottles	:	none
	Concretions	:	none
	Stone	:	stoneless
	Structure	:	single grain
	Consistence	:	loose
	Structural condition	:	moderate
	Pores	:	
	Roots	:	few, fine and very fine
	CaCO ³	:	non-calcareous
	Depth	:	120cm
	Boundary	:	-----
Wetness Class		:	I

STATEMENT OF SOIL PHYSICAL CHARACTERISTICS

SOIL TYPE II

Topsoil	Texture	:	medium sandy loam (occasionally loamy medium sand)
	Colour	:	10YR3/3, 10YR4/2
	Mottles	:	none
	Concretions	:	none
	Stone	:	5% small, medium and few large flints
	Roots	:	many, fine and very fine
	CaCO ³	:	non-calcareous
	Depth	:	32/35cm
	Boundary	:	smooth/abrupt
Upper subsoil	Texture	:	loamy medium sand
	Colour	:	10YR5/4, 10YR4/4, 7.5YR4/4
	Mottles	:	none
	Concretions	:	none
	Stone	:	35% small, medium and few large flints
	Structure	:	weakly developed, coarse sub-angular blocky
	Consistence	:	very friable
	Structural condition	:	moderate
	Pores	:	1-2%
	Roots	:	many, fine and very fine
	CaCO ³	:	non-calcareous
	Depth	:	55/65cm
	Boundary	:	smooth/abrupt
Lower subsoil	Texture	:	medium sand
	Colour	:	10YR6/6, 10YR7/6
	Mottles	:	none
	Concretions	:	none
	Stone	:	45-55% (include. 20% small chalk stones)
	Structure	:	single grain
	Consistence	:	loose
	Structural condition	:	moderate
	Pores	:	
	Roots	:	few, fine and very fine
	CaCO ³	:	calcareous
	Depth	:	120cm
Wetness Class:		:	I