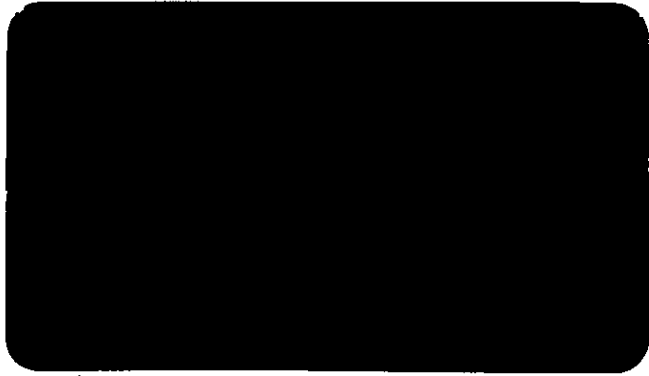




ADAS

FOOD, FARMING, LAND & LEISURE



**AGRICULTURAL LAND CLASSIFICATION
AND SOIL PHYSICAL CHARACTERISTICS**

NEWTON LONGVILLE BRICKWORKS

BUCKINGHAMSHIRE

AGRICULTURAL LAND CLASSIFICATION INCORPORATING SOIL PHYSICAL CHARACTERISTICS
NEWTON LONGVILLE BRICKWORKS, BUCKINGHAMSHIRE

1.0 INTRODUCTION

- 1.1 An Agricultural Land Classification survey was carried out over approximately 108.2 ha of land at Slad Farm, on the outskirts of Milton Keynes in connection with a planning study for the redevelopment of an old brickworks.
- 1.2 The site comprises an area of arable agricultural land together with land affected by previous brickworking activities. It is bounded to the north by an extensive area of worked out clay pits, part of which is currently being land filled. Extraction in the area immediately to the north of the farmland appears to have ceased relatively recently. On the eastern side of the site the farmland is bounded by a main railway line. The southern side of the site comprises an old brick pit and spoil heap together with the remains of the old brickworks. The western boundary abuts open farmland.
- 1.3 A total of 79 soil observations were made using a spade and dutch auger to a depth of 1 m, together with 3 soil pits to help assess subsoil conditions in more detail.
- 1.4 The site was surveyed in October 1992 and all the arable land had been harvested and was either receiving winter cultivations or still under stubble following crops of cereals and oilseed rape. A field at the northern end of the site had already been sown with oilseed rape.
- 1.5 On the published Agricultural Land Classification (ALC) Map Sheet 146 (MAFF, 1972) the whole area is shown as Grade 3.

2.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

- 2.1 Climatic information for the site has been interpolated from the 5 km grid dataset produced by the Meteorological Office (Met Office, 1989). The average annual rainfall for the site is 655 mm and the number of days that the soils are likely to be at field capacity is 140.
- 2.2 The accumulated temperature for the area is approximately 1390 degrees Celsius. This parameter indicates the cumulative build up of warmth available for crop growth and in conjunction with rainfall has an influence on the development of soil moisture deficits and susceptibility to drought. The moisture deficits for wheat and potatoes on this site are 105 mm and 97 mm respectively.

- 2.3 These climatic characteristics do not impose any climatic limitation on the ALC grade of this site.

Relief

- 2.4 The site surveyed comprises gently undulating land ranging in altitude from 95 m AOD in the west to 80 m AOD in the north. A small stream crosses the southern part of the site from south-west to north-east, in a very shallow valley. Neither altitude nor relief constitute a limitation to the ALC grade.

Geology

- 2.5 The published 1:25,000 scale geology map (Geol Surv. 1971) shows the majority of the area to be covered by Glacial Boulder Clay, with smaller areas of Oxford Clay and Head. A narrow band of Alluvium is mapped in the valley referred to above, whilst on the eastern side of the site a large lens of Glacial Sand and Gravel has been delineated with an area described as Glacial Lake Deposit in the north.

Soils

- 2.6 The published 1:250,000 soil map for the area (Soil Surv, 1983) shows the occurrence of the Hanslope Association, described as "slowly permeable calcareous clayey soils with some slowly permeable non calcareous clayey soils".
- 2.7 During the current survey four distinct soil types were identified, all of which were generally slowly permeable, fine loamy and clayey. A brief description of the soil types is given below and more detailed soil information is given in Appendix I.

Soil Type I

- 2.8 The first soil type which occurs extensively over the western half of the site comprises soils with a grey brown calcareous clay topsoil over a yellowish brown faintly mottled calcareous clay upper subsoil. Below 45 to 60 cm depth the grey, strongly mottled, chalky boulder clay is found. These soils are typically slowly permeable in the chalky boulder clay and have been assessed as Wetness Class II or occasionally III.

Soil Type II

- 2.9 The second soil type, associated with the Oxford Clay mapped by the Geological Survey, gives rise to soils with a grey brown non calcareous clay topsoil over an olive brown non calcareous clay upper subsoil which has faint ochreous mottling. Below 45 to 70 cm the subsoil becomes a pale olive and grey clay with distinct ochreous mottling which is invariably calcareous. The subsoil is generally stoneless and has a strong angular blocky structure with highly polished ped faces, becoming coarser with depth. These soils have been classified as Wetness Class II or III.

Soil Type III

2.10 The third soil type which occupies the majority of the land to the north of the Slad Farm buildings is associated with the area identified by the Geological Survey as Glacial Sands and Gravels. These soils have a non calcareous heavy clay loam topsoil overlying a brown non calcareous heavy clay loam upper subsoil. Both the topsoil and upper subsoil are slightly stony with small angular flints. Below 50 to 70 cm depth is a band of moderately stony mottled sandy clay which overlies the grey calcareous stoneless clay similar to that described at depth in paragraph 2.9 above. The soils have been classified as Wetness Class II although an occasional profile is Wetness Class I due the greater depth to the underlying slowly permeable clay.

Soil Type IV

2.11 In the shallow valley a narrow band of alluvial soils have been identified. These soils have a dark grey brown non calcareous clay topsoil over a yellowish brown non calcareous clay subsoil which becomes progressively greyer and more mottled with depth. Due to the low lying nature of the land the soils will be susceptible to a fluctuating groundwater table and despite the lack of substantial gleying in the upper subsoil have been assessed as Wetness Class II.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The site has been classified using the guidelines contained in the Agricultural Land Classification of England and Wales (MAFF, 1988). A breakdown of the ALC grades in hectares and % terms is given below.

Grade	Area	%
3a	56.5	52
3b	20.9	19
Non agricultural	7.4	21
Farm buildings	0.9	7
Urban	22.5	1
Total	108.2	100

Grade 3a

3.2 The land on either side of the shallow valley has been mapped as Grade 3a. These areas comprise soils described in paragraphs 2.8 and 2.11 above, which either have calcareous clay or non calcareous heavy clay loam topsoils. The main limitation associated with all these soils is wetness. Both the soil types described have slowly permeable subsoils and have been assessed as Wetness Class II or in the case of the calcareous clay soils, occasionally Wetness Class III, but due to the calcareous nature, the workability limitations are slightly ameliorated. However considerable care must be taken in the timing of cultivations to prevent damage to these soils and hence cropping versatility will be restricted.

Grade 3b

- 3.3 The non calcareous clay soils have been mapped as Grade 3b. These comprise the soils developed on the Oxford Clays or in the alluvium associated with the shallow valley that crosses the site. The main limitations associated with these soils are wetness and workability. The soils have been classified as Wetness Class II or III and under the climatic regime (140 field capacity days) are restricted at best to this grade. The wetness limitation associated with these heavy textured soils means that considerable care must be exercised in the timing of cultivations and trafficking to prevent structural damage to the soils, thereby restricting the cropping potential of the land.

Non Agricultural

- 3.4 Six areas of non agricultural land have been mapped all of which are covered by woodland or scrub vegetation. The small area to the south of the farm buildings contains a small pond with trees and rough vegetation.

Urban

- 3.5 Four areas of urban land have been identified. The two main ones represent the areas that have been affected by the activities of the brickworks in the past. The land to the north is occupied by a clay pit, whilst that to the south carries the remains of an old demolished brickworks, namely the old foundations, roads and spoil heaps which have become covered in scrub vegetation. The remaining two areas represent houses which are included with the site boundary.

Farm Buildings

- 3.6 The area of agricultural buildings associated with Slad Farm has been delineated.

Resource Planning Team
Cambridge, ADAS Statutory Unit

October 1992

Appendix I

Description of Soil Types

Soil Type I 39.6ha

Topsoil	Texture	clay, occasionally heavy clay loam
	CaCO ₃	calcareous
	Colour	brown (10YR4/3)
	Stone	slightly stony, 2-5% small angular flints
	Depth	25-30 cm
	Boundary	clear smooth
Upper Subsoil	Texture	clay
	CaCO ₃	calcareous
	Colour	yellowish brown or light olive brown (10YR5/4 & 2.5Y5/4)
	Mottles	few/common faint ochreous
	Stone	c.5% small and medium angular flints and small chalk fragments
	Depth	45-60 cm
	Structure	moderate medium & fine angular blocky
	Consistence	firm and plastic
	Porosity	slightly porous
	Roots	few/common fine & very fine
Boundary	clear smooth	
Lower Subsoil	Texture	clay
	CaCO ₃	calcareous
	Colour	light brownish grey (2.5Y6/3)
	Mottles	common distinct ochreous and grey (10YR5/6 & 2.5Y6/1)
	Stone	common medium and large chalk and flints, many very fine chalk

Depth	110+ cm
Structure	weak very coarse blocky/massive
Consistence	firm
Porosity	very slightly porous
Roots	few very fine

Soil Type II 19.14a

Topsoil	Texture	clay
	CaCO ₃	non calcareous
	Colour	brown (10YR4/3)
	Stone	1% small subangular flints
	Depth	27-30 cm
	Boundary	abrupt irregular

Upper Subsoil	Texture	clay
	CaCO ₃	non calcareous
	Colour	light olive brown (2.5Y5/3 & 5/4)
	Mottles	few/common faint ochreous
	Stone	very few flints or stoneless
	Depth	45-70 cm
	Structure	strong medium and coarse angular blocky, polished ped faces
	Consistence	firm
	Porosity	very slightly porous
Lower Subsoil	Roots	few/common fine
	Boundary	abrupt smooth
	Texture	clay

CaCO ₃	calcareous
Colour	light brownish grey and grey (2.5Y6/3 & 6/1)

Mottles	common distinct ochreous
Stones	none
Depth	110+ cm
Structure	strong very coarse angular blocky
Consistence	very firm
Porosity	very slightly porous
Roots	few very fine

Soil Type III 21.3ha

Topsoil	Texture	heavy clay loam
	CaCO ₃	non calcareous
	Colour	brown (10YR4/3)
	Stone	3-5% small and medium angular flints
	Depth	28-32 cm
	Boundary	gradual smooth

Subsoil 1	Texture	heavy clay loam
	CaCO ₃	non calcareous
	Colour	yellowish brown (10YR5/4)
	Mottles	none
	Stone	3-5% small and medium angular flints
	Depth	45-60 cm
	Structure	moderate coarse angular blocky
	Consistence	friable
	Porosity	slightly porous
	Roots	few/common fine
	Boundary	clear smooth

Subsoil 2	Texture	sandy clay
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CaCO ₃	non calcareous
Mottles	few/common faint ochreous
Stone	10-15% small & medium angular flints
Depth	60-70 cm
Structure	moderate fine angular blocky
Consistence	friable
Porosity	slightly porous
Roots	few fine
Boundary	abrupt smooth

Subsoil3

Texture	clay
CaCO ₃	calcareous
Colour	light brownish grey & grey (2.5Y6/3 & 6/1)
Mottles	common distinct ochreous
Stone	stoneless
Depth	110+ cm
Structure	coarse angular blocky
Consistence	firm
Porosity	very slightly porous
Roots	very few fine

REFERENCES

- GEOLOGICAL SURVEY OF ENGLAND AND WALES, 1971. Sheet SP83 (& parts of SP73, 74, 84, 93 & 94). Milton Keynes, Solid and Drift, 1:25,000 scale.
- MAFF, 1972. Agricultural Land Classification Map No 146. Provisional 1:63,360 scale.
- MAFF, 1988. Agricultural Land Classification of England and Wales (Revised Guidelines and Criteria for the grading of Agricultural Land).
- METEOROLOGICAL OFFICE, 1989. Climatological Data for Agricultural Land Classification.
- SOIL SURVEY OF ENGLAND AND WALES, 1983. Sheet 4. "Soils of Eastern England". 1:250,000 scale.

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Map 1: Agricultural Land Classification

Map 2: Soil Types