

AGRICULTURAL LAND CLASSIFICATION INCORPORATING SOIL PHYSICAL CHARACTERISTICS

LAND AT PORTLY FORD FARM, COLD ASHBY, NORTHANTS

1.0 BACKGROUND

1.1 The site is the subject of an application by Bennie Land and Minerals Limited for the extraction of sand and gravel and infilling with inert waste. The site survey was carried out in January 1992, to assess the agricultural land quality and soil physical characteristics. 10 soil inspections were made using a hand held 120 cm Dutch soil auger, and 2 soil pits dug to assess subsoil conditions.

2.0 SITE PHYSICAL CHARACTERISTICS

2.1 Site specific climate data has been interpreted from information contained in the 5 km grid dataset compiled by the Meteorological Office. This shows average annual rainfall (AAR) to be approximately 700 mm (27.6"). This data also indicates that soils are at field capacity for 156 days and moisture deficits are 92 mm for wheat and 79 mm for potatoes. The accumulated temperature above 0°C January to June (ATO) is 1296 Day °C.

2.2 The combination of a relatively high annual average rainfall and a low cumulative build up of warmth available for crop growth (ATO) imposes a slight climatic limitation on the Agricultural Land Classification (ALC) grade of the site. Consequently these climatic characteristics restrict the land to grade 2 (see Figure 1, Page 6, MAFF, 1988).

Altitude and Relief

2.3 The site comprises a gently undulating area of approximately 163 m AOD. Gradient does not constitute a limitation to ALC grade.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The site is shown as grade 3 on the Ministry's published 1:63,360 scale provisional ALC map, sheet 133 (MAFF, 1974). This map is of a reconnaissance nature designed primarily for strategic planning purposes,

and does not delineate areas of less than 80ha (200 ac).

- 3.2 More recently, in 1991, a desk study of published information indicated that the likely grade of this site was subgrade 3a or 3b depending upon the drainage status and texture of the soils present. The current field survey was undertaken to provide more detailed information on land quality.
- 3.3 A precise breakdown of the ALC grades in hectares and % terms is provided below. The definitions of grades 2 and 3a are included in Appendix 1.

Grade	ha	%
2	2.7	50.9
3a	2.6	49.1
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TOTAL	<u>5.3</u>	<u>100</u>

Grade 2

- 3.4 The grade 2 land is associated with soil type 1 which is described in detail in paragraph 4.3.
- 3.5 Soils typically comprise medium clay loam topsoils over sandy clay loam subsoils. The stone content increases from about 12% flints in the upper subsoil to approximately 35% in the lower subsoil. This land is well drained, and it experiences no significant droughtiness imperfections. However, the climatic limitation described in paragraph 2.2 limits this land to grade 2.

Subgrade 3a

- 3.6 The grade 3a land is associated with the less stony soils of soil type 2 (described in para 4.4). The profiles comprise medium clay loam topsoils over a sandy clay or heavy clay loam upper subsoil. Below 55 cm subsoils become clays with approximately 3% flints. The lower horizons show signs of wetness with common ochreous and pale mottles and manganese concentrations. These factors combine with the coarse angular blocky structure to indicate the presence of a slowly permeable layer. Consequently the drainage status is assessed as wetness class III (Figure

8, Page 39, MAFF, 1988), Thus a moderate wetness limitation restricts the land to subgrade 3a.

4. SOIL PHYSICAL CHARACTERISTICS

Geology

- 4.1 The geology has been mapped at a scale of 1:63,360 (Geological Survey of England and Wales, 1969). This shows the whole of the area as glacial boulder clay.

Soils

- 4.2 The published 1:250,000 reconnaissance scale soil map (Soil Survey of England and Wales, 1983) shows the whole site to comprise the Beccles 3 Association. The soils are described as slowly permeable, seasonally waterlogged fine loamy over clayey soils with similar soils with only slight seasonal waterlogging. Some calcareous clayey soils also occur especially on steeper slopes. The detailed site inspection indicates that two soil types occur.

Soil Type 1 (refer to Appendix 2 and Soil Types Map)

- 4.3 This soil type covers about half the site and typically comprises medium clay loam topsoils over slightly stony upper subsoils with a sandy clay loam texture. Lower subsoils are moderately stony sandy clay loams or occasionally medium sandy loams and occur from 50/60 cm depth.

Soil Type 2 (refer to Appendix 2 and Soil Types Map)

- 4.4 Over the remainder of the site better bodied, less stony soils are mapped they typically comprise medium clay loam topsoils over sandy clay (or occasionally heavy clay loam) upper subsoils which are very slightly stony. The lower subsoils found at a depth of 45/55 cm consist of gleyed clays which are slowly permeable.

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DESCRIPTION OF AGRICULTURAL LAND CLASSIFICATION GRADES 2 AND SUBGRADE 3A

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.

SOIL PHYSICAL CHARACTERISTICS

PORTLY FORD FARM, NORTANTS

SOIL TYPE 1

Topsoil	Texture	:	medium clay loam
	CaCO ₃	:	non-calcareous
	Colour	:	dark greyish brown (10YR42)
	Stone	:	very slightly stony (2-3%)
	Structure	:	cultivation zone - not applicable
	Boundary	:	clear smooth
	Roots	:	many fine and very fine
	Depth	:	30/35 cm
Upper Subsoil	Texture	:	sandy clay loam
	CaCO ₃	:	non-calcareous
	Colour	:	dark yellowish brown (10YR44) and (10YR46)
	Stone	:	slightly stony (10-12% angular subangular and rounded flints)
	Structure	:	moderately developed medium and coarse subangular blocky
	Boundary	:	clear smooth
	Roots	:	many fine and very fine
	Depth	:	variable in the range 50/60 cm, typically 55 cm

Lower Subsoil Texture : sandy clay loam
CaCO₃ : non-calcareous
Colour : yellowish brown (10YR56 and 10YR58)
occasionally strong brown (75YR56)
Stone : moderately stony, 35% small angular,
subangular and rounded flints
Structure : too stony to assess structure
Roots : few fine and very fine
Depth : 120 cm

SOIL TYPE 2

Topsoil Texture : medium clay loam
CaCO₃ : occasionally very slightly calcareous
Colour : dark greyish brown (10YR42) and dark brown
(10YR43)
Stone : very slightly stony 2-3% small angular,
subangular and rounded flints
Structure : cultivation zone - not applicable
Boundary : clear smooth
Roots : common fine and very fine
Depth : 30/35 cm

Upper Subsoil Texture : heavy clay loam or sandy clay
CaCO₃ : non-calcareous
Colour : dark yellowish brown (10YR44) and (10YR46)
Stone : very slightly stony (2-3%) occasionally
12% small angular, subangular and rounded
flints
Structure : moderately developed coarse subangular
blocky
Boundary : clear smooth
Roots : common fine and very fine
Depth : 45/60 cm generally 55 cm

Lower Subsoil Texture : clay
CaCO₃ : non-calcareous
Colour : dark yellowish brown (10YR56) or strong
brown (75YR56)
Stone : very slightly stony, 3-4% small subangular,
and rounded flints
Structure : moderately developed coarse angular blocky
Roots : common fine and very fine
Depth : 120 cm

REFERENCES

GEOLOGICAL SURVEY OF ENGLAND AND WALES (1969). Solid and drift edition sheet 170, Market Harborough 1:63360 scale.

MAFF, (1974). Agricultural Land Classification Map sheet 133 Provisional 1:63360 scale.

MAFF, (1988). Agricultural Land Classification of England and Wales (Revised Guidelines and criteria for grading the quality of Agricultural Land, Alnwick).

METEOROLOGICAL OFFICE, (1989). Published climatic data extracted from the agroclimatic dataset, compiled by the Meteorological Office.

SOIL SURVEY OF ENGLAND AND WALES (1983). Sheet 4, Soils of Eastern England 1:250,000 scale.