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AGRICULTURAL LAND CLASSIFICATION AND SOIL PHYSICAL CHARACTERISTICS

BARRINGTON QUARRY EXTENSION CAMBRIDGESHIRE

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1.0 *BACKGROUND*

1.1 This 5.7 hectare site was inspected on 3 June 1993 in connection with a mineral extraction proposal. A total of nine auger borings were made on a structured 50 metre grid, and this data was supplemented by information collected from two soil profile pits. At the time of the survey the land was under set aside.

1.2 On the published provisional Agricultural Land Classification Map Sheet 148 (MAFF 1968), the site is shown as grade 2. Since this map is of a reconnaissance nature, designed primarily for strategic planning purposes, the current survey was undertaken to provide more detailed information on land quality and soil physical characteristics.

2.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

2.1 Site specific climate information has been obtained by interpolating data contained in the 5 km grid dataset produced by the Meteorological Office (Met Office 1989). This information shows that the site has an average annual rainfall of 578 mm, and an accumulated annual temperature (January to June) of 1405°C. Moisture deficits for wheat and potatoes are 118 mm and 113 mm respectively, and the site is at field capacity for 101 days each year. These figures do not impose any climatic limitation to the land quality.

Altitude and Relief

2.2 The highest area, at around 62 m AOD, lies in the north of the site, from where the land slopes gently southwards, with a small valley feature in the east of the site. In general, slopes are 2-3°C, which do not constitute any limitation to land quality. However, in the west of the site slopes of 8° occur which restrict land quality to subgrade 3b.

Geology and Soils

2.3 The published 1:50,000 scale geology map sheet 204 (GSEW 1976) shows the site to comprise mainly boulder clay deposits overlying Lower Chalk, which outcrops in the extreme south of the site.

2.4 The Soil Survey of England and Wales have mapped the area at a 1:63360 scale. This map (Sheet 148, SSEW 1968) shows the site to comprise the Hanslope Soil Association (*1). The current, more detailed survey identified two main soil types.

2.5 Over the majority of the site soils derived from the chalky boulder clay occur and profiles comprise very slightly stony heavy clay loam topsoils, over gleyed boulder clay which becomes slowly permeable at depth. These profiles are calcareous throughout, and wetness class has been assessed as II. The technical data relating to these soils may be found in Appendix II, Soil Type 1.

2.6 In the small valley feature in the east of the site are soils which comprise very slightly stony heavy clay loam topsoils over clay to depth. Wetness class has been assessed as I, and profiles are calcareous throughout. The technical data relating to these soils may be found in Appendix II, Soil Type 2.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The majority of the site has been graded as 2, with a small area of subgrade 3b. A precise breakdown of the ALC grades in hectares and percentage terms is given below.

	AGRICULTURAL LAND CLASSIFICATION	
Grade	Ha	%
2	4.5	78.9
3b	1.2	21.1
TOTAL	5.7	100

3.2 The definition of ALC grades is given in Appendix 1.

(*1) Hanslope Association: Slowly permeable calcareous clayey soils. Some slowly permeable non calcareous clayey soils. Slight risk of water erosion.

Grade 2

3.3 Land graded 2 corresponds to both soil types. Over the majority of the site are gleyed soils derived from the chalky boulder clay deposits (see paragraph 2.5). Profiles are moderately well drained and are calcareous throughout. Minor winter wetness the the chief limitation on this land.

3.4 Grade 2 land also occurs in the east of the site and is associated with the clayey soils described in paragraph 2.6. Although profiles are well drained and calcareous throughout, the heavy textured topsoil imposes minor wetness and workability limitations to the land.

Subgrade 3b

3.5 Subgrade 3b is mapped in the west of the site where gradients of 8° restrict the type and range of machinery which can be effectively and safely used.

R DAVIES
ADAS Resource Planning Team
Huntingdton Statutory Centre

REFERENCES

GEOLOGICAL SURVEY OF ENGLAND AND WALES, 1976. Sheet 204 (Biggleswade) Drift, 1:50,000 scale.

MAFF, 1968. Agricultural Land Classification Map Sheet 148, Provisional, 1:63,000 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 climatological data for Agricultural Land Classification.

SOIL SURVEY OF ENGLAND AND WALES, 1968. Sheet 148 (Saffron Walden) 1:63,360 scale.

Appendix 2

STATEMENT OF SOIL PHYSICAL CHARACTERISTICS

BARRINGTON QUARRY EXTENSION CAMBRIDGE

SOIL TYPE 1

Topsoil	Texture	:	heavy clay loam
	$CaCO_3$	:	strongly calcareous
	Colour	:	10YR4/3
	Stone	:	very slightly stony, (1-5%) typically 2-3% mix of chalk fragments and small flints.
	Depth	:	25-30 cms
	Structure	:	cultivated zone - not applicable
	Boundary	:	smooth, abrupt
	Roots	:	many
Upper Subsoil	Texture	:	clay
	$CaCO_3$	:	strongly calcareous
	Colour	:	2.5Y5/4 with common distinct ochreous mottles, 10YR5/8 and common distinct grey mottles 2.5Y7/1.
	Stone	:	very slightly to slightly stony (1-15%) typically 7-10% weathered chalk fragments.
	Depth	:	65 cms
	Structure	:	moderately developed medium and coarse subangular blocky.
	Consistence	:	firm
	Porosity	:	<0.5% biopores
	Roots	:	common
	Boundary	:	gradual
Lower Subsoil	Texture	:	clay
	$CaCO_3$	:	strongly calcareous
	Colour	:	2.5Y5/4 with common distinct ochreous mottles 10YR5/6 and 10YR5/8 and common distinct grey mottles 2.5Y7/1.
	Stone	:	slightly stony (6-15%), typically 15% weathered chalk fragments.
	Depth	:	120 cms plus
	Structure	:	weakly developed coarse subangular blocky.
	Consistence	:	firm
	Porosity	:	<0.5% biopores
	Roots	:	common

Miscellaneous information: wetness class II

SOIL TYPE 2

Topsoil	Texture	:	heavy clay loam
	$CaCO_3$	:	strongly calcareous
	Colour	:	10YR4/3
	Stone	:	very slightly stony, (1-5%) typically 2-3% chalk fragments.
	Depth	:	28 cms
	Structure	:	cultivated zone - not applicable
	Boundary	:	smooth, clear
	Roots	:	many
Upper Subsoil	Texture	:	clay
	$CaCO_3$	:	strongly calcareous
	Colour	:	10YR4/4
	Stone	:	very slightly stony (1-5%) typically 2-3% weathered chalk fragments.
	Depth	:	50-55 cms
	Structure	:	moderately developed medium and coarse angular blocky.
	Consistence	:	friable
	Porosity	:	<0.5% biopores
	Roots	:	many
	Boundary	:	gradual
Lower Subsoil	Texture	:	clay
	$CaCO_3$	:	strongly calcareous
	Colour	:	10YR4/4
	Stone	:	very slightly stony (1-5%), typically 2-3% weathered chalk fragments.
	Depth	:	120 cms plus
	Structure	:	moderately developed coarse subangular blocky.
	Consistence	:	friable
	Porosity	:	<0.5% biopores
	Roots	:	common

Miscellaneous information: wetness class I