

PHYSICAL CHARACTERISTICS REPORT INCORPORATING AGRICULTURAL LAND CLASSIFICATION

LAND AT COTTINGHAM QUARRY, COTTINGHAM, NR. CORBY, NORTHANTS.

1.0 INTRODUCTION

- 1.1 A survey was carried out over 36 ha of land to the west of Cottingham Quarry, Cottingham, Nr Corby, Northamptonshire in connection with a planning application by Starmin plc, for an extension to the existing quarry.
- 1.2 The site lies approximately 2 km to the east of Corby and being triangular in shape is bounded on two sides by roads, the A427 to the south and the B670 to the north and west. A bridleway runs down the eastern boundary across which is the existing Cottingham Quarry.
- 1.3 A total of 36 observations were made using a spade and dutch auger down to 1.1 m unless stopped by impenetrable limestone. In addition three soil pits were dug to assess the subsoil conditions of the three soil mapping units identified in the survey.
- 1.4 The site comprises six fields which are all currently under "Set Aside" and with the exception of a small field at the eastern end, which is under grass, all support volunteer wheat and a normal range of arable weeds.
- 1.5 The area is shown as Grade 3 on the Agricultural Land Classification (ALC) map for the area (MAFF, 1974).

2.0 SITE PHYSICAL CHARACTERISTICS

Climate

- 2.1 Area specific climate data has been obtained by interpolating information contained in the 5 km grid data set produced by the Meteorological Office (Met Office, 1989).
- 2.2 The average annual rainfall for the site is approximately 620 mm and the soils in this area are likely to be at field capacity for 130 days.
- 2.3 The accumulated temperature for the site is approximately 1327 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 and 95 mm respectively.
- 2.4 There is no overall climatic limitation to the agricultural use of this land.

Relief

2.5 The site lies at an average altitude of approximately 125 metres AOD, ranging from 130 m on the southern edge to 110 m in the north. Slopes are generally relatively gentle from south to north over the majority of the site, although slightly steeper slopes are found on the north western side. A dry valley runs from south to north toward the western side of the site, where there is also evidence of old quarrying activities. Gradient and altitude however do not impose any limitation on the ALC grading.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The land has been classified in accordance with the guidelines of the Agricultural Land Classification of England and Wales (MAFF, 1988). A breakdown of the individual grades found together with their areas is given below:

ALC grade	Area (ha)	%
2	6.1	17.1
3a	22.9	64.1
3b	4.2	11.8
4	2.5	7.0
TOTAL	35.7	100.0

3.2 The majority of the site comprises soils developed on limestone drift which have slightly to moderately stony topsoils over very stony subsoils. The major limitation associated with these soils is droughtiness due to the amount of limestone in the soil profile. Where the topsoil stone content is less than 10% (medium and large tabular limestone) the land has been classified as Grade 3a but where stonier topsoils were found then the land has been downgraded to Grade 3b.

3.3 A small area of soils developed on chalky boulder clay was found at the south eastern corner of the site and this area has also been mapped as Grade 3a due to a wetness and workability limitation.

3.4 Two areas of Grade 2 have been mapped where deep heavy clay loam soils were mapped. Although these soils are free draining, the presence of a heavy clay loam topsoil will result in workability limitations during the wetter periods of the year.

3.5 A small area of Grade 4 has been mapped where old quarrying activities have resulted in very stony soils with topsoil stone contents in excess of 20%. The very stony nature of these soils will result in a severe droughtiness limitation together with problems for machinery used in cultivation and seedbed preparation.

3.6 A full description of the soil physical characteristics is given below.

4.0 SOIL PHYSICAL CHARACTERISTICS

Geology

- 4.1 The area has been mapped by the Geological Survey (1976) and is shown to be underlain by the Lower Lincolnshire Limestone, which at the southern edge of the site, is overlain by glacial till.

Soils

- 4.2 The Soil Survey of England and Wales have mapped the area at a scale of 1:250,000 (Soil Surv, 1983) and the site is shown to comprise soils of the Elmton 2 association. This association is made up of well drained soils overlying limestone, dominated by the shallow, stony, fine loamy Elmton series, with associated smaller areas of deeper, fine loamy brown earths.
- 4.3 During the current detailed survey three soil types were mapped and their locations are shown on the accompanying map. All the mapping units have fine loamy textures and differ in terms of stone content and drainage characteristics. Mapping units A and B are both free draining but differ in terms of stone content with Mapping Unit A being stony or very stony especially in the subsoil. Mapping Unit C whilst having similar topsoil characteristics is developed on the chalky boulder clay and as such is imperfectly drained.

SOIL MAPPING UNIT A (26.9 ha)

4.4 Slightly stony dark brown medium clay loam over very stony strong brown clay loam.

Topsoil	Texture	medium clay loam
	CaCO ₃	strongly calcareous
	Colour	dark brown (10YR3/3)
	Stone	slightly to moderately stony 5-18% small, medium and large tabular limestone. (Very stony ie >20%, in area affected by previous quarrying activity)
	Depth	27-30 cm
	Roots	common fine and very fine
	Boundary	abrupt smooth
Subsoil	Texture	heavy clay loam
	CaCO ₃	strongly calcareous
	Colour	strong brown (7.5YR4/6 & 5/6)
	Stone	very stony 35-40% increasing to 60-70% with depth large tabular limestone.
	Depth	80 cm+
	Structure	masked by stone
	Consistence	friable
	Porosity	moderate
Roots	few fine and very fine	

SOIL MAPPING UNIT B (6.2 ha)

4.5 Brown very slightly stony heavy clay loam over brown or yellowish brown heavy clay loam.

Topsoil	Texture	heavy clay loam (occasionally medium clay loam)
	CaCO ₃	slightly or non calcareous
	Colour	brown (10YR4/3)
	Stone	1-2% small flints and limestone
	Depth	30 cm
	Roots	common fine and very fine
	Boundary	clear smooth
Subsoil	Texture	heavy clay loam occasionally clay
	CaCO ₃	non calcareous
	Colour	brown or yellowish brown (7.5YR or 10YR5/4)
	Stone	stoneless or very slightly stony 0-2% small flint
	Depth	75-110 cm+
	Structure	moderate very coarse subangular blocky
	Consistence	friable to firm
	Porosity	moderate
	Roots	few fine and very fine
	Boundary	abrupt smooth where applicable

NB. Some profiles underlain by limestone drift others by boulder clay.

SOIL MAPPING UNIT C (2.7 ha)

4.6 Brown slightly heavy clay loam topsoil over slightly mottled greyish brown calcareous clay over strongly mottled chalky boulder clay.

Topsoil	Texture	heavy clay loam
	CaCO ₃	non calcareous
	Colour	brown (10YR4/3)
	Stone	Slightly stony 2-3% small and medium flints and limestone
	Depth	30 cm
	Roots	common fine and very fine
	Boundary	clear smooth
Subsoil 1	Texture	heavy clay loam or clay
	CaCO ₃	calcareous
	Colour	greyish brown or brown (2.5Y5/3 or 10YR5/3)
	Mottles	common faint ochreous
	Stone	few 2-3% flint and chalk fragments
	Depth	60-85 cm
	Structure	moderate coarse prismatic
	Consistence	firm
	Porosity	slightly porous
	Roots	few fine and very fine
	Boundary	abrupt smooth

Subsoil 2	Texture	clay
	CaCO ₃	strongly calcareous
	Colour	greyish brown (2.5Y5/3)
	Mottles	common distinct ochreous and grey
	Stone	5-10% small and medium chalk and flints, occasional ironstone.
	Depth	120 cm+
	Structure	weak very coarse subangular blocky/prismatic
	Consistence	firm
	Porosity	very slightly porous
	Roots	few very fine

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References

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Classification.
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