

Cambs 06/90

PHYSICAL CHARACTERISTICS REPORT INCORPORATING
AGRICULTURAL LAND CLASSIFICATION

The Carstone Pit, East Winch

1. INTRODUCTION

1.1 This 14.9 ha site was inspected on 5 February 1990 in connection with proposals to extract Carstone and sand from a north-westerly extension of the existing Carstone Pit. Fifteen soil inspections were carried out on a 100m grid basis using a 120cm hand held Dutch soil auger. Data collected were supplemented by observations from 2 soil profile pits. At the time of survey the site comprised only one enclosure and included an area of the existing Carstone Pit. The land was cultivated and was to be subsequently sown with sugar beet.

2. AGRICULTURAL LAND CLASSIFICATION

2.1 The site has been graded according to the Revised guidelines and criteria for assessing the quality of agricultural land (MAFF; 1988).

2.2 The site is graded 3b. The table below provides a breakdown of land in the 3b and non-agricultural categories, in ha and % terms.

ALC	ha	%
3b	13.0	87.1
non-agricultural	1.9	12.9
Total	14.9	100.0

2.3 The soils on this site are relatively uniform in nature and have developed in glaciofluvial cover sands overlying Carstone. Typical profiles are freely drained (Wetness Class I) and comprise medium sand textures to depth. The land is thus limited by droughtiness constraints. Although these droughtiness imperfections may be offset to some extent by the availability of irrigation water (of which there is a supply at this site), the occurrence of medium sand

topsoil textures prevent upgrading above subgrade 3b. This is because coarse textured sand topsoils are particularly prone to rapid moisture loss and can constitute an unfavourable environment for seedling germination/establishment during early spring.

The area of the former Carstone working has been mapped as non-agricultural.

A full description of site/soil physical factors is provided below.

3. SITE PHYSICAL CHARACTERISTICS

Climate

- 3.1 Site specific climate data have been obtained by interpolating information contained in the 5km grid agroclimatic dataset prepared by the Meteorological Office (Met.Office 1989).
- 3.2 This indicates that the site has an average annual rainfall of 624mm (24.6") which is relatively low by national standards. Soils are likely to be at field capacity for a relatively short period of 124 days from early December to early April (MAFF 1984).
- 3.3 The accumulated temperature for this area is approximately 1425 degrees. This parameter indicates the cumulative build-up of warmth available for crop growth and influences the development of soil moisture deficits (SMD)* and hence susceptibility to drought. The soil moisture deficits for this site are 115mm for wheat and 110mm for potatoes, these are slightly higher than average for lowland England. (It is the interaction of climate with the low available water capacity of the sandy textures that results in the existing drought constraints).

* SMD represents the balance between rainfall and evapotranspiration during the growing season.

Relief

3.4 The site occupies gently sloping land between 13m and 10m AOD with falls to the northwest and southwest.

4. SOIL PHYSICAL FACTORS

Geology

4.1 The drift geology of this area is mapped at a scale of 1:233440 by the Geological Survey of Great Britain (sheet 12: 1971). This identifies the presence of Carstone overlain by glacial sands and gravels.

Soils

4.2 The Soil Survey of England and Wales have mapped the "Soils of Norfolk" at a scale of 1:100 000 (1973). This maps the Newport 4 Association of deep, well drained sandy soils over the entire site.

4.3 Only one soil mapping unit has been identified due to the relatively uniform nature of the soils found.

SOIL MAPPING UNIT I

Topsoil: Texture	:	medium sand, (very occasionally loamy medium sand in the southwest).
CaCO ₃	:	very slightly calcareous to slightly calcareous.
Colour	:	typically dark brown (7.5 YR 3/2 and 3/4) or dark reddish brown (5 YR 3/3 and 3/4).

Stone : typically 3-5%, (occasionally 7%) of soil volume, comprising small and medium Carstone fragments and few small and medium sub-angular flints.

Depth : in the range 30-40 cms, typically 35cms.

Structure : cultivation zone - not applicable.

Boundary : smooth abrupt lower boundary.

Roots : few fine and very fine roots.

Upper
Subsoil Texture : medium sand.

CaCO₃ : non-calcareous

Colour : typically strong brown (7.5 YR 4/6 and 5/6) or dark brown (7.5 YR 4/4) occasionally yellowish red (5 YR 4/6).

Stone : variable, in the range 5-20% of soil volume, comprising small, medium and large Carstone fragments and occasional sub-angular flints.

Depth : in the range 45-55 cms (typically 50cms).

Structure : weakly developed coarse sub-angular blocky.

Consistence : very friable.

Boundary : smooth clear lower boundary.

Roots : few fine and very fine roots.

Lower

Subsoil: Texture : medium sand

CaCO₃ : non-calcareous

Colour : typically strong brown (7.5 YR 5/6) or yellowish brown (10 YR 5/8).

Stone : variable; in the range 20-30% of soil volume, comprising small, medium and large Carstone fragments.

Depth : to one metre plus

Structure : single grain

Consistence : very friable

Roots : very few fine and very fine roots.

Soil variations : towards the southwest of the site, adjacent to the northern north-east to south-west running boundary, soil profiles may overlie finer medium sand at depths below 60-100 cms (typically 65-70 cms).

Further information: These soils are freely-draining (Wetness Class I) and groundwater was not encountered in any of the profiles.

References:

MAFF (1988) : Revised guidelines and criteria for assessing the quality of agricultural land.

METEOROLOGICAL OFFICE (1989): Climatological Data for Agricultural Land Classification.

MAFF (1984) : The Agricultural Climate of England & Wales.

GEOLOGICAL SURVEY OF GB (1971) : Drift edition Geology Map (Sheet 12)
1:233440.

SOIL SURVEY OF ENGLAND AND WALES (1973): Soils of Norfolk, 1:100 000.