Cambs 33/90

PHYSICAL CHARACTERISTICS REPORT INCORPORATING AGRICULTURAL LAND CLASSIFICATION

LAND NORTH OF POTTON ROAD, NEAR SANDY HEATH, SANDY, BEDFORDSHIRE

1.0 INTRODUCTION

1.1 A survey was carried out over 27.6 ha of land to the north of Potton Road Sandy, Bedfordshire in connecton with a planning application by Redlands Aggregates Ltd to extract sand.

1.2 A total of 35 inspections were made using a dutch auger to a depth of 1.1 metres unless stopped by impenetrable stone. In addition two soil pits were dug to assess subsoil conditions.

2.0 AGRICULTURAL LAND CLASSIFICATION

2.1 The definition of the Agricultural Land Classification grades are included in Appendix 1.

2.2 The table below shows the breakdown of ALC grades in hectares and percentage terms for the survey area.

Agricultural Land Classification

Grade	ha	%
3a	2.7	9.8
3b	18.2	65.9
4	6.7	24.3
Total	27.6	100.0

2.3 Soils typically comprise loamy medium sand and medium sandy loam topsoils with similarly textured subsoils overlying medium or coarse sand at 35/70 cm. The main limitation to agricultural land quality

for this site is droughtiness which derives from a combination of soil texture and stoniness.

2.4 GRADE 3a

2.4.1 Land graded 3a occurs in a small area on the eastern side of the site. Soils are very slightly stony and comprise medium sandy loam topsoil over medium sandy loam subsoil becoming lighter with depth.

2.5 GRADE 3b

2.5.1 The majority of the site has been classified as 3b. These soils are more droughty than those described in paragrpah 2.4.1 and typically comprise loamy medium sand upper horizons over medium sand at depth. Stone content varies considerably but is commonly 5-10% in the topsoil and 10-15% in the subsoil.

2.6 GRADE 4

An area of grade 4 land was identified in the north west corner of the site. These soils are significantly droughty and typically comprise loamy medium sand topsoil over weathered ironstone, fractured horizontally, and containing narrow lenses and occasional pockets of medium sand. Topsoil stone is typically 10-20% and subsoil stone is in the range 15-32%.

2.7 A full description of site and soil physical characteristics is given below.

3.0 SITE PHYSICAL CHARACTERISTICS

CLIMATE

3.1 Climatic information of the site has been interpolated from the 5 km grid datasets produced by the Meteorological Office (Met Office, 1989). The average annual rainfall for the site is 554 mm, which is

low by national standards. The number of days at which the site is likely to be at field capacity is also low at 95.

3.2 The accumulated temperature for this area is approximately 1405 degrees celsius and soil moisture deficits for wheat and potatoes are 118 and 112 respectively.

3.3 These climatic characteristics do not impose a climatic limitation on the ALC grading of the site.

RELIEF

The altitude of the site is approximately 65m AOD. A gentle valley feature occurs along the centre of the site orientated in a north-south direction. The valley sides are very gently sloping (<1°) in the south of the site becoming slightly more pronounced (1-2°) towards the north. Consequently, gradient and altitude do not constitute limitations to ALC grade.

4.0 SOIL PHYSICAL CHARACTERISTICS

4.1 GEOLOGY

The published 1:50 000 solid and drift edition geology sheet 204 (Biggleswade) shows the site to comprise Lower Greensand deposits overlying Kimmeridge clay.

4.2 SOILS

The published 1:63 360 soil map, sheet 147 (Bedford and Luton) maps the whole site as the Cottenham soil series. During the course of this survey, a detailed inspection of the soils indicated the presence of two main soil types which are more fully described below.

SOIL MAPPING UNIT 1

Topsoil

Texture : loamy medium sand or occasionally medium sandy loam (rarely coarse sandy loam).

$CaCO_3$: non calcareous

Colour : dark brown (7.5 yr 3/2)

Stone : in the range 0-20% soil volume, typically 5-10% comprising mainly small and medium ironstone and sandstone.

Depth : typically 28-30 cm

Structure : cultivation zone - not applicable.

Boundary : smooth clear lower boundary

Roots : common fine and very fine roots.

Upper Subsoil

Texture : loamy medium sand or occasionally medium sandy loam (rarely coarse sandy loam or loamy coarse sand).

$CaCO_3$: non calcareous

Colour : reddish brown, typically 7.5 yr 4/2.

Stone : variable; in the range 0-20% soil volume, comprising small, medium and occasionally large ironstone and sandstone.

Depth : in the range 35-70 cm, typically 40 cm.

Structure : Weakly developed coarse sub angular blocky tending to coarse platy at the topsoil/subsoil interface.

Consistence : friable

Boundary : smooth clear lower boundary.

Roots : common fine and very fine roots.

Lower subsoil

Texture : typically medium sand but occasionally coarse sand.

$CaCO_3$: non calcareous

Colour : typically brown, 7.5 yr 4/5

Stone : variable; in the range 0-12% soil volume, small, medium and occasionally large but typically stoneless 80 cm+

Depth : 110 cm+

Structure : Weak to very weak coarse and very coarse subangular blocky tending to massive.

Consistence : very friable

Roots : few fine and very fine

SOIL MAPPING UNIT 2

Topsoil

Texture : loamy medium sand

$CaCO_3$: no calcareous

Colour : dark brown (7.5 YR 3/2)

Stone : in the range 10-25% soil volume, mainly small and medium, occasionally large ironstones.

Depth : in the range 27-32, typically 28 cm

Structure : cultivations zone - not applicable.

Boundary : smooth clear lower boundary

Roots : Common fine and very fine

Subsoil

Weathered ironstone rock: this was fractured horizontally into 1-2 cm thick beds in upper horizons allowing common (fine and very fine) root penetration to 60 cm depth. Fractures in the ironstone were filled with narrow lenses or occasionally pockets of medium sand. Below 60 cm weathering appeared less advanced. Beds were coarser, 3/4 cm +. Roots were few (fine and very fine) and were mainly confined to sandy lenses and pockets, becoming increasingly few towards 80 cm. From 80 cm+, further digging was prevented by particularly hard dense ironstone slabs.

$CaCO_3$: non calcareous

Colour : typically brown, 7.5 YR 4/5

Stone : typically 32% weathered ironstone fractured horizontally into plate-like layers.

Depth : impenetrable 80 cm+

Structure : undeterminable - masked by stones.

Roots : few fine and very fine to 80 cm

Supplementary Information

Wetness class : all soils were found to be wetness class I.

References

Soil Survey of England and Wales, 1963, sheet 147 (Bedford and Luton) 1:63,360.

Agricultural Land Classification, 1971, Sheet 147 (Luton and Bedford) 1:63,360.

Geological Survey of Great Britain, 1976, Drift edition geology sheet 204 (Biggleswade) 1:63,360.

MAFF, 1988, Agricultural Land Classification of England and Wales.

Meteorological Office, 1989, Climatological data for Agricultural Land Classification

Appendix 1

Grade 1 - excellent quality agricultural land

Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly includes top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality.

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 more more variable than Grade 1.

Grade 3 - good to moderate quality agricultural land

Land with moderate limitations will affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. When more demanding crops and 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 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.

Subgrade 3b - moderate quality agricultural land

Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.

Grade 4 - poor quality agricultural land

Land with severe limitations which significantly restrict the range of crops and/or level of yields. It is mainly suited to grass with occasional arable crops (eg cereals and forage crops) the yields of which are variable. In most climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

Grade 5 - very poor quality agricultural land

Land with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.