Cambs 21/92

AGRICULTURAL LAND CLASSIFICATION

AND SOIL PHYSICAL CHARACTERISTICS

BERKHAMSTED BY-PASS

BORROW PITS

HERTFORDSHIRE

AGRICULTURAL LAND CLASSIFICATION INCORPORATING SOIL PHYSICAL CHARACTERISTICS

BERKHAMSTED BY-PASS BORROW PITS

1.0 BACKGROUND

The sites (A, B, C and D) are the subject of applications by J Jones and Amey Construction for the extraction of gravel in association with the Berkhamsted by-pass construction. ADAS carried out a survey in May 1992, to assess the agricultural land quality and soil physical characteristics. Thirty-two soil inspections were made using a hand held 120 cm Dutch soil auger and soil pits were dug to assess subsoil conditions.

2.0 SITE PHYSICAL CHARACTERISTICS

Climate

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 157 days and moisture deficits are 97 mm for wheat and 86 mm for potatoes. The accumulated temperature above 0° January to June (ATO) is 1365 day °C. These climatic characteristics do not constitute a limitation to the ALC grade.

Altitude and Relief

2.2 There are 4 (A, B, C and D) individual sites situated along the line of the Berkhamsted by-pass. Two sites (C and D) are situated at 100 m AOD and the two western sites (A and B) at higher elevations ranging from 140 to 175 m AOD. Site A lies on the north eastern facing valley side which has areas of moderately steep slopes. At site A these steep slopes restrict theland to subgrade 3b.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The sites are shown as grade 3 on the MAFF 1:63,360 scale provisional ALC map sheet 160 (MAFF, 1970). This map is of a reconnaissance nature designed primarily for strategic planning purposes and does not delineate areas of less than 80 ha (200 acres). The current survey was undertaken to provide more detailed information on land quality and soil physical characteristics.

3.2 A precise breakdown of the ALC grades in hectares and in % terms is provided below. The definition of grades 2, 3a and 3b are included in Appendix 1.

Site	A(ha)	B(ha)	C(ha)	D(ha)	Total (ha)	%
Grade 2	5.0	-	-	-	5.0	15.7
3a	6.0	5.0	2.0	5.5	18.5	58.2
3b	0.9	4.1	3.3	-	8.3	26.1
Total	11.9	9.1	5.3	5.5	31.8	100

Grade 2

3.3 Grade 2 land has been mapped on site A and is associated with soil type 2 which is described in detail in paragraph 4.7. This area accounts for approximately 40% of site A and occurs on the gentle slopes of the valley side. The profiles are fine loamy, well drained and derived from the chalk deposits. Due to the presence of the chalk stones there is a minor droughtiness constraint which excludes the land from a higher grade.

Subgrade 3a

3.4 Land graded 3a accounts for over half of the land across the four sites (A to D).

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

4.7 The majority of land on site A is mapped as soil type 2. The soils comprise slightly stony, calcareous clay loam topsoils over chalky clay loam upper subsoils. Below about 45/50 cm the chalk stone content increases to approximately 50% by volume. This horizon of loosely bedded weathered chalk becomes impenetrable to the hand auger below 80 cm depth.

May 1992

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APPENDIX 1

DESCRIPTION OF THE GRADES AND SUBGRADES

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.

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.

APPENDIX 2

SOIL PHYSICAL CHARACTERISTICS

BERKHAMSTED BY-PASS

SOIL TYPE (Variants A and B)

Topsoil	Texture	:	clay loam
	Colour	:	dark brown (10YR33)
	Stone	:	slightly stony 10% total in 1A 25% total in 1B
	Structure	:	cultivation zone
	Boundary	:	clear smooth
	Roots	:	many fine and very fine
	Depth	:	30/35 cm
Upper Subsoil	Texture	:	heavy clay loam
	Colour	:	dark yellowish brown (10YR44)
	Stone	:	very stony (40% medium/large angular flints)
	Structure	:	moderately developed coarse subangular blocky
	Boundary	:	clear wavy
	Roots	:	many fine and very fine
	Depth	:	typically 50 cm
Lower subsoil	Texture	:	heavy clay loam
	Colour	:	dark yellowish brown (10YR44) and (10YR32)
	Stone	:	very stony, 60% medium and large angular flints
	Structure	:	too stony to assess
	Boundary	:	clear smooth
	Roots	:	common fine and very fine
	Depth	:	120 cm

SOIL TYPE 2

Topsoil	Texture	:	medium clay loam
	Colour	:	dark brown (10YR33) and dark greyish brown (10YR42)
	Stone	:	slightly stony 6-8% medium angular and subangular flints
	Structure	:	cultivation zone
	Boundary	:	clear smooth
	Roots	:	common fine and very fine
	Depth	:	30/35 cm
Upper Subsoil	Texture	:	medium silty clay loam
	Colour	:	10YR54
	Stone	:	moderately stony, 20% chalk fragments
	Structure	:	
	Boundary	:	clear smooth
	Roots	:	common fine and very fine
	Depth	:	45/50 cm
Lower subsoil	Texture	:	clay or silty clay
	Colour	:	05Y81
	Stone	:	very stony, 50% chalk stone
	Structure	:	fragmented rock jointing
	Roots	:	few fine and very fine
	Depth	:	120 cm

REFERENCES

GEOLOGICAL SURVEY OF ENGLAND AND WALES (1946). Sheet 238, Aylesbury, 1:63,360 scale.

MAFF (1970). Agricultural Land Classification Map Sheet 160 Provisional 1:63,360 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 (1961). Sheet 238 Aylesbury, 1:63,360 scale.

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

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Map 1: Agricultural Land Classification

Map 2: Soil Types