

PHYSICAL CHARACTERISTICS REPORT INCORPORATING
AGRICULTURAL LAND CLASSIFICATION

LAND ADJACENT TO THE M25 MOTORWAY; NR IVER, BUCKS.

1.0 INTRODUCTION

- 1.1 A survey was carried out on three small sites adjacent to the M25 motorway on which it is proposed to raise the existing levels to accommodate soils arising from the M25 widening works.
- 1.2 The sites are located to the south west of Uxbridge and to the north of the B470 road (Iver Lane). Sites A and B are on the western side of the motorway, between the Colne Brook and the motorway, whilst Site C is located to the east of the motorway on land which has been restored following sand and gravel extraction.
- 1.3 Site A extends to 2.5 ha. Site B 1.9 ha and Site C 4.6 ha. A total of 22 auger borings were made over the three sites together with a soil pit. All observations were made to a depth of 1.1 m unless prevented by the underlying gravels.
- 1.4 At the time of survey all three sites were in permanent grassland.
- 1.5 The published Agricultural Land Classification (ALC) map for the area (MAFF 1970) shows all the land to the east of the Colne Brook in this area as land in non-agricultural use.

2.0 SITE PHYSICAL CHARACTERISTICS

Climate

- 2.1 Climatic information for the site has been interpolated from the 5 km grid dataset produced by the Meteorological Office (Met Office 1989). The average annual rainfall for the site is 681 mm and the number of days that the soils are likely to be at field capacity is 141.
- 2.2 The accumulated temperature for the area is approximately 1478 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 115 mm and 110 mm respectively.
- 2.3 There is no overall climatic limitation to the agricultural use of the land.

Relief

- 2.4 The two sites on the western side of the motorway are both low lying and relatively flat, being on the floor of the valley associated with the Colne Brook. The land at the north and east of Site A is marginally higher, with some localised very minor undulations. Site C on the eastern side of the motorway has a very gentle slope toward the motorway. The altitude of the sites is approximately 30 m AOD. Gradient and altitude therefore do not impose any limitation on the ALC grading.

3.0 AGRICULTURAL LAND CLASSIFICATION

- 3.1 The three sites have 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 on each site together with their areas is given below:

Site A

Grade	Area (ha)	%
3a	1.4	56
3b	1.1	44
Total	2.5	100

Site B

Grade	Area (ha)	%
3b	1.9	100

Site C

Grade	Area (ha)	%
4	4.4	95.6
Agric buildings	0.2	4.4
Total	4.6	100

- 3.2 Site A has been classified as subgrades 3a and 3b. The better quality soils which occur on the marginally higher land at the north and east of the site have been classified as 3a. These soils have a minor wetness limitation during the wetter periods of the year and are moderately droughty in the drier periods due to a restricted rooting depth caused by the underlying gravel seam. The lower lying land adjacent to the Colne Brook has been graded 3b as a result of a moderate wetness limitation which, associated with the heavy clay loam topsoil textures restricts the workability of the land.

- 3.3 Site B has all been graded 3b on account of the heavy soil textures and a moderate wetness limitation which restricts the workability of the land.
- 3.4 Site C is part of an area of land restored following sand and gravel extraction. At the time of survey the top 25 cm of the soil profile was saturated, with water ponding on the surface in localised depressions and in hoof marks. This surface waterlogging is the result of compaction in the lower part of the topsoil and subsoil, restricting the downward passage of water. As a result of this compaction, rooting will be restricted and apart from a moderately severe wetness/workability restriction during the wetter periods, the land will suffer from drought during drier weather conditions. This area has therefore been classified as Grade 4.
- 3.5 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 (1922) as Alluvium.

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 sites are shown to comprise soils of the Frome Association¹.
- 4.3 During the current survey three soil types were identified and their locations are shown on the accompanying map. Soil Types 1 and 2 are developed in the alluvium whilst soil type 3 comprises soils restored following sand and gravel extraction and is a mixture of alluvial soils and London Clay. Soil Types 1 and 2 both have fine loamy topsoils and differ mainly in the clay content of the subsoil and also in their drainage characteristics, with Soil Type 1 becoming clayey at depth. Soil Type 3 is similar in some respects to Soil Type 1, but has the very dark grey London Clay mixed in with both the topsoil and subsoil in some profiles.

¹ Frome Association: This association includes soils in chalky and gravelly alluvium along streams draining the Chalk and adjacent formations. The thickness of alluvium varies but in most valleys fine textured deposits rest on flint and/or chalk gravel. Calcareous marl and peat bands within the soils occur locally.

SOIL TYPE 1 (3.0 ha)

- 4.4 Slightly stony dark grey brown heavy clay loam over dark grey brown, mottled heavy clay loam/clay over strongly mottled grey brown clay. Waterlogged sand and gravel below 60-80 cm depth.

Topsoil	Texture	heavy clay loam
	Colour	dark grey brown 10YR3/2
	Stone	3-5% small & medium flints
	Depth	22-25 cm

Subsoil 1	Texture	heavy clay loam or clay
	Colour	grey brown 10YR4/2 and 5/2
	Mottles	common distinct ochreous
	Stone	3-5% small & medium flints
	Structure	coarse angular blocky
	Depth	35-45 cm

Subsoil 2	Texture	clay
	Colour	grey brown 10YR5/2
	Mottles	common/many ochreous and grey
	Stone	variable 2-20%
	Structure	coarse angular blocky or massive
	Depth	60-80 cm

Occasional bands of shelly marl and/or peat found at depth.
Underlying gravels are waterlogged. Wetness Class III

SOIL TYPE 2 (1.4 ha)

- 4.5 Dark grey brown medium or heavy clay loam over yellowish brown slightly mottled heavy clay loam.

Topsoil	Texture	medium or heavy clay loam
	Colour	dark grey brown 10YR3/2
	Stone	3-5% small & medium flints
	Depth	20-25 cm

Subsoil	Texture	heavy clay loam
	Colour	Yellowish brown 10YR5/4
	Mottles	Common distinct ochreous below 45cm
	Structure	Coarse subangular blocky
	Stones	variable, 5-15% flints
	Depth	50-65 cm

Soils underlain by waterlogged gravels. Wetness Class II

SOIL TYPE 3 (4.4 ha)

4.6 Very dark grey brown heavy clay loam/clay over mixed grey brown and very dark grey clay. Compact.

Topsoil	Texture	heavy clay loam and clay often mixed
	Colour	very dark grey brown 10YR2/3
	Stone	variable 2-15% small and medium flints
	Depth	20-40 cm
Subsoil	Texture	clay
	Colour	mixed, grey brown and very dark grey 10YR5/2 and 10YR2/1
	Structure	massive
	Stone	variable, 0-20% flints
	Depth	100+ cm

The soil has been restored following sand and gravel extraction and restored profiles can vary markedly. The soils are basically similar to Soil Type 1 but have inclusions of London Clay which is found below the gravel seams in this area. Top 25 cm is saturated, but below this depth the soil is drier, due to compaction restricting downward movement of water.

Wetness Class IV?

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REFERENCES

Geological Survey, (1974). Drift edition Geology Map, Beaconsfield/Aylesbury, Sheet 255. 1:63,360 scale.

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Meteorological Office, (1989). Climatological Data for Agricultural Land Classification.

Soil Survey of England and Wales, (1984). Soils and their Use in South East England.