PHYSICAL CHARACTERISTICS REPORT INCORPORATING AGRICULTURAL LAND CLASSIFICATION

LAND AT MANOR PIT, BASTON, LINCOLNSHIRE

1.0 INTRODUCTION

1.1 A survey was carried out over 30.6 ha of land at Manor Pit, Baston, Lincolnshire in connection with a planning application to extract sand and gravel. The land lies to the west of the existing pit and to the south and east of the village of Baston.

1.2 A total of 31 inspections were made using a dutch auger, to a depth of 1.2 m unless stopped by impenetrable gravel. In addition, two soil pits were dug to assess subsoil conditions. The inspections were carried out on 30/31 October 1989.

1.3 The area of survey was contained in three fields. The largest, to the north was growing winter cereals, as was the field at the southern edge. The field in the middle was partly under stubble and partly harvested potatoes.

2.0 AGRICULTURAL LAND CLASSIFICATION

2.1 The land has been classified as grades 2 and 3a and a breakdown of the grades found is given below:

Grade	Area	%
2	12.0	9.2
3a	18.6	0.8
Total	30.6	100

2.2 The whole area is covered by a similar soil type, Badsey series (Soil survey of England and Wales, 1984), but differing in depth over the underlying sands and gravel. The soils are free draining and easily worked and thus the major limitation is droughtiness. The shallow phase soils are moderately droughty grade 3a whilst the deep phase are only slightly droughty and hence grade 2.

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

3.0 SITE PHYSICAL CHARACTERISTICS

Climate

3.1 Climatic information for 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 572 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 106.

3.2 The accumulated temperature for this area is approximately 1445 degree celsius and soil moisture deficits for wheat and potatoes are 120 and 116 respectively.

3.3 There is no overall climatic limitation to agricultural use on this land.

Relief

3.4 The land is relatively flat with some minor undulations. The altitude is approximately 6m AOD.

4.0 SOIL PHYSICAL CHARACTERISTICS

Geology

4.1 The area is shown on the 1:50000 Geology map sheet 158 (Geol Surv 1984) as first River Terrace deposits overlying Kellaways Sand.

Soils

4.2 The soils were mapped by the Soil Survey of England and Wales (Soil Surv. 1984) as the Badsey 2 Association, with the soils belonging to the well drained Badsey Series, typical brown calcareous earths.

4.3 This survey shows that the whole area comprises soils of the Badsey series, although there are two distinct phases present, a deep phase and a shallow phase, overlying the sands and gravels. These two phases, whilst similar in topsoil characteristics, have been identified as two soil mapping units, on account of the depth of soil available for restoration purposes.

SOIL MAPPING UNIT 1 (DEEP PHASE)

Topsoil	Texture:	medium clay loam
	$CaCO_3$:	calcareous
	Colour:	brown (10 YR 4/4 and 10 YR 4/3)
	Stone:	typically 2-5% comprising small and very small flints and limestone fragments.
	Depth to base of horizon:	in range 30-40 cm, but mainly 35-40 cm.
	Structure:	cultivated.

	Boundary:	smooth sharp lower boundary.
	Roots:	common fine and very fine roots.
Subsoil 1	Texture:	medium clay loam.
	$CaCO_3$:	calcareous.
	Colour:	brown (7.5 YR and 10 YR 4/6).
	Stone:	typically 2-5% small and very small flint and limestone.
	Depth to base of horizon:	in range 55-90 cm, typically 60-70 cm.
	Structure:	moderately developed medium subangular blocky.
	Consistence:	friable.
	Porosity:	moderately porous, 2% biopores.
	Boundary:	sharp smooth lower boundary.
	Roots:	common fine and very fine roots.
Subsoil 2	Texture:	loamy medium sand, occasionally sandy loam.
	$CaCO_3$:	very calcareous.
	Colour:	yellowish brown (10 YR 5/6)
	Stone:	typically 25-30% small and very small

	Depth to base of horizon:	difficult to determine by auger due to stones. (100cm in pit)
	Structure:	massive.
	Consistence:	firm.
	Porosity:	very porous.
	Boundary:	merging lower boundary into the sand and gravel.
	Parent Material.	
Sand and Gravel	i)	70% stones mainly small and very small.
	ii)	Coarse sand matrix.
	iii)	Stones mainly flints and limestone.
	iv)	very calcareous.
	v)	no roots.

SOIL MAPPING UNIT 2. (SHALLOW PHASE)

Topsoil	Texture:	medium clay loam.
	$CaCO_3$:	calcareous
	Colour:	brown (10 YR 4/4 and 4/3)
	Stone:	typically 5-10% on the northern side and 2-5% on the southern, comprising small and very small flints and limestone

		fragments.
	Depth to base of horizon:	35-45 cm but typically 40 cm.
	Structure:	cultivated in top 30 cm and medium subangular blocky below.
	Boundary:	sharp smooth lower boundary.
	Roots:	common fine and very fine roots.
Subsoil	Texture:	Loamy medium sand occasionally sandy loam.
	$CaCO_3$:	calcareous.
	Colour:	yellowish brown (10 YR 5/6).
	Stone:	moderately stony in range 15-30% small and very small flints and limestone, occasionally up to 50% mainly very small.
	Depth to base of horizon:	in range 60-70 cm.
	Structure:	subangular blocky? (generally too stony to determine)
	Boundary:	merging lower boundary into sand and gravel.
	Roots:	few/common fine and very fine.
	Parent Material:	As above for mapping unit 1.

Additional Data

Both soil mapping units are free draining and therefore classified as wetness class I. The loamy medium sand referred to above in both descriptions would be included in with the workable deposit due to the amount of stone present. Consequently the material available for restoration would be the medium clay loam.

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REFERENCES

Geological Survey of Great Britain (1984) 1:50,000 solid and drift edition geology map sheet No 158 Peterborough.

MAFF (1988) Agricultural Land Classification of England and Wales.

Meteorological Office (1989) Climatological data for Agricultural Land Classification.

Soil Survey of England and Wales (1984) Soils and their use in Eastern England.