AGRICULTURAL LAND CLASSIFICATION AND STATEMENT OF SOIL PHYSICAL CHARACTERISTICS LAND ADJACENT TO A16, PARTNEY/SPILSBY, LINCOLNSHIRE

AGRICULTURAL LAND CLASSIFICATION AND STATEMENT OF SOIL PHYSICAL CHARACTERISTICS

LAND ADJACENT TO A16, PARTNEY/SPILSBY, LINCOLNSHIRE

1.0 BACKGROUND

1.1 ADAS Statutory Group were requested on behalf of MAFF to assess the agricultural land classification (ALC) and soil physical characteristics of the site at Partney/Spilsby in connection with a proposed leisure centre.

1.2 On the published Provisional 1:63 360 scale Agricultural Land Classification Map, sheet number 114 (MAFF, 1974) the majority of the site is shown as grade 3 with small areas in the north and east of the site mapped as grade 2. Since this map is of a reconnaissance nature designed primarily for strategic planning purposes, the current survey was undertaken to provide more detailed information on land quality.

2.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

2.1 Site specific climatic information was obtained by interpolating data contained within the 5 km grid climatological datasets for Agricultural Land Classification (ALC) produced by the Meteorological Office, 1989. This information shows that the site has an average annual rainfall of 659 mm and an accumulated temperature of 1404 °C. Moisture deficits are 109 mm for wheat and 102 mm for potatoes and the site is at field capacity for 139 days each year. These characteristics do not impose any overall climatic limitation to land quality at the site. However, climatic factors specifically field capacity days and soil moisture deficits do interact with soil factors to influence soil wetness and droughtiness.

Altitude and Relief

2.2 The site lies on gently sloping land within the valley of the River Lymn and one of its tributaries, with maximum gradients of 6°, and ranges in height from 14 to 36 m AOD. Neither gradient or altitude constitute limitations to agricultural land quality.

Geology and Soils

2.3 The small scale published 1:253 440 scale drift edition geology map, sheet 12 (Geological Survey of Great Britain, 1971) shows the site to comprise alluvium, peat and fen silts north of the river and a small area of fen and valley gravels or loams of various ages in a curve of the River Lymn (centre of the site). Over the majority of the remainder of the site Kimmeridge Clay outcrops while in the southwest, adjacent to the A16, Gault Clay is mapped.

2.4 On the published 1:250 000 reconnaissance scale soils map, sheet 4 (Soil Survey of England and Wales, 1983) the site is shown as comprising mainly the Fladbury 2 Association (*1) with Wickham 2 Association (*2) in the south and southwest. During the current survey a more detailed inspection of the soils was carried out, three main soil types were identified.

Soil Type 1 (refer to Appendix 1 and Soil Types Map)

2.5 Just over half of the site comprises soil type 1 which broadly corresponds to the mapped heavy soils of the Fladbury 2 Association. Profiles typically

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(*1) Fladbury 2 Association - stoneless clayey soils variably affected by groundwater, some with sandy subsoils. Some similar fine loamy soils. Flat land. Risk of flooding.

(*2) Wickham 2 Association - slowly permeable seasonally waterlogged fine loamy over clayey, fine silty over clayey soils. Small areas of slowly permeable calcareous soils on steeper slopes.

comprise stoneless clay or heavy clay loam (occasionally medium clay loam) topsoils over similar upper subsoils which merge into clay at depth. These soils are poorly drained and are generally slowly permeable immediately below the topsoil (i.e. wetness class IV).

Soil Type 2 (refer to Appendix 1 and Soil Types Map)

2.6 Soil type 2 is mapped in the northwest and south of the site in three areas. These soils typically comprise medium clay loam or occasionally sandy clay loam topsoils over similar textured upper subsoils. Lower subsoils typically consist of sandy clay loam which may become clay with depth below 50/75 cm. Profiles are moderately well to imperfectly drained (wetness class II/III) and stoneless throughout.

Soil Type 3 (refer to Appeneix 1 and Soil Types Map)

2.7 Soil type 3 is mapped in two areas in the centre of the site, south of the River Lymn where lighter soils prevail. Profiles typically comprise medium sandy loam or occasionally loamy medium sand topsoils over similar or occasionally heavier textured subsoils (heavy textures below 70/80 cm). These soils are well to moderately well drained (wetness class I/II) and stoneless throughout.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 *The definitions of the Agricultural Land Classification (ALC) grades* are included in Appendix 2.

3.2 The table overleaf provides a breakdown of the ALC grades in hectares and percentage terms.

AGRICULTURAL LAND CLASSIFICATION

Grade	ha	%
2	13.25	16
3a	23.50	28
3b	47.70	56
TOTAL	84.45	100

Grade 2

3.3 Land graded 2 is associated with the free draining, deep coarse loamy soils described in paragraph 2.7 (Soil Type 3) and are mapped in the central eastern part of the site. Moisture balance calculations indicate that these soils are slightly droughty and therefore the land is restricted to grade 2 (very good quality agricultural land).

Subgrade 3a

3.4 Land graded 3a occurs in three situations.

3.5 In the central western part of the site land graded 3a occurs in conjunction with the droughtier coarse loamy soils described in paragraph 2.7 (Soil Type 3). The presence of loamy medium sand within the profiles reduces the available water capacity for crop growth and therefore the land is graded 3a (good quality agricultural land) due to moderate droughtiness limitations.

3.6 Elsewhere subgrade 3a land is associated with the fine loamy over clayey soils described in paragraph 2.6 (Soil Type 2). The profiles are slowly permeable at depth and have been assessed as wetness class II or III depending upon the depth to the clayey horizons. This combines with topsoil textures to limit the land to 3a due to moderate wetness and workability imperfections.

Subgrade 3b

3.7 Land mapped as subgrade 3b covers just over half of the site and is associated with the heavy textured clayey soils described in paragraph 2.5 (Soil Type 1). These profiles are poorly drained (wetness class IV) and this factor in combination with relatively heavy topsoil textures restricts land quality to subgrade 3b (moderate quality agricultural land) on wetness and workability grounds.

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REFERENCES

GEOLOGICAL SURVEY OF GREAT BRITAIN (ENGLAND AND WALES), 1971. Sheet 12, drift edition, scale 1:253 440.

MAFF, 1974. Agricultural land Classification Map (Provisional), sheet 114, scale 1:63 360.

MAFF, 1988. Agricultural Land Classification of England and Wales (Revised Guidelines and criteria for grading the quality of Agricultural Land). Alnwick.

METEOROLOGICAL OFFICE, 1989. Climatological Datasets for Agricultural Land Classification. Meteorological Office, Bracknell.

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

Appendix 1

SOIL PHYSICAL CHARACTERISTICS

LAND ADJACENT TO A16, PARTNEY/SPILSBY, LINCOLNSHIRE

SOIL TYPE 1 (47.7 hectares)

Topsoil	Texture	:	clay or heavy clay loam (occasionally medium clay loam).
	Colour	:	10YR4/3 (brown) and 10YR4/2 (dark greyish brown).
	Stone	:	negligible
	Structure	:	cultivation zone - not applicable
	Boundary	:	clear, smooth
	Roots	:	common fine and very fine
	Depth	:	30/40 cm
Upper subsoil	Texture	:	clay or heavy clay loam
	Colour	:	typically 10YR5/2 (greyish brown) and 10YR5/3 (brown)
	Stone	:	negligible
	Structure	:	weakly developed coarse subangular blocky.
	Consistence	:	firm
	Porosity	:	<0.5% biopores
	Boundary	:	abrupt, wavy
	Roots	:	common fine and very fine
	Depth	:	40/50 cm
Lower subsoil	Texture	:	clay
	Colour	:	typically 5Y6/2 (light olive grey), 5Y5/2 (olive grey) and 2.5Y5/1 (grey).
	Stone	:	negligible
	Structure	:	moderately developed coarse angular blocky
	Consistence	:	firm
	Porosity	:	<0.5% biopores
	Roots	:	few fine and very fine
	Depth	:	120 cm+

Other observations: typically non-calcareous throughout; common ochreous mottles noted below topsoil, profile assessed as wetness class IV.

SOIL TYPE 2 (15.5 hectares)

Topsoil	Texture	:	medium clay loam or occasionally sandy clay loam.
	Colour	:	10YR4/3 (brown), 10YR4/2 (dark greyish brown) and 10YR3/3 (dark brown).
	Stone	:	negligible
	Structure	:	cultivation zone - not applicable
	Boundary	:	clear, smooth
	Roots	:	common fine and very fine
	Depth	:	20/30 cm
Upper subsoil	Texture	:	medium clay loam or sandy clay loam
	Colour	:	10YR5/4 (yellowish brown) and 10YR5/3 (brown).
	Stone	:	negligible
	Structure	:	moderately developed, coarse subangular blocky.
	Consistence	:	friable
	Porosity	:	<0.5% biopores
	Boundary	:	abrupt, smooth
	Roots	:	common fine and very fine
	Depth	:	35/70 cm
Lower subsoil	Texture	:	sandy clay loam becoming clay with depth
	Colour	:	10YR5/3 (brown)
	Stone	:	negligible
	Structure	:	weakly developed, coarse angular blocky
	Consistence	:	firm
	Porosity	:	<0.5% biopores
	Roots	:	common fine and very fine
	Depth	:	120 cm+

Other observations: typically non-calcareous throughout; faint ochreous mottling in upper subsoil; common ochreous mottles noted from 40 cm+ ; assessed as wetness class II/III depending on depth to slowly permeable layer.

SOIL TYPE 3 (21.2 hectares)

Topsoil	Texture	:	medium sandy loam (occasionally loamy medium sand).
	Colour	:	10YR4/3 (brown), 10YR4/2 (dark greyish brown) and 10YR3/3 (dark brown).
	Stone	:	negligible
	Structure	:	cultivation zone - not applicable
	Boundary	:	clear, smooth
	Roots	:	many fine and very fine
	Depth	:	15/30 cm
Upper subsoil	Texture	:	medium sandy loam or loamy medium sand.
	Colour	:	10YR5/4 (yellowish brown) and 10YR4/4 (dark yellowish brown).
	Stone	:	negligible
	Structure	:	weakly developed, coarse and medium subangular blocky.
	Consistence	:	friable
	Porosity	:	<0.5% biopores
	Boundary	:	clear, smooth
	Roots	:	common fine and very fine
	Depth	:	60/90 cm
Lower subsoil	Texture	:	clay, sandy clay loam, medium sandy loam or loamy medium sand.
	Colour	:	7.5YR5/3 (brown), 10YR5/2 (dark greyish brown) and 10YR6/6 (brownish yellow).
	Stone	:	negligible
	Structure	:	moderately developed, coarse and very coarse angular blocky.
	Consistence	:	friable to firm
	Porosity	:	<0.5% biopores
	Roots	:	common fine and very fine
	Depth	:	120 cm+

Other observations: typically non-calcareous throughout; faint ochreous mottling often in upper subsoil. Where clay lower subsoil common distinct ochreous mottling, where sandy lower subsoil below 70 cm profiles often wet. Assessed as wetness class I or II depending on depth to slowly permeable layer and level of ground water table.

Appendix 2

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 include 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 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.

Grade 4 - poor quality agricultural land

Land with severe limitations which significantly restrict the range of crops and/or levels of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yield 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.

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MAP 1: AGRICULTURAL LAND CLASSIFICATION

MAP 2 : SOIL TYPES