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AGRICULTURAL LAND CLASSIFICATION DRAFT CITY OF NOTTINGHAM LOCAL PLAN CHILWELL DAM FARM, STRELLEY, NOTTINGHAM (SITE 1)

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1.0 BACKGROUND

1.1 The site an area of approximately 49 hectares, is the subject to a proposal in the Draft City of Nottingham Local Plan for a high quality "business park". In January 1995, ADAS Statutory Resource Planning Team undertook an Agricultural Land Classification (ALC) survey to assess the agricultural land quality, carrying out a total of 49 auger borings. In addition three soil inspection pits were dug to assess subsoil conditions. Assessment was made following the guidelines in MAFF publication "Revised Guidelines and Criteria for Grading the Quality of Agricultural Land" (MAFF, 1988).

1.2 At the time of the survey much of the land was under arable production with cereals and rape being grown. Immediately to the west and south of Chilwell Dam Farm and a small area on the steepest land along the western boundary are under permanent pasture. Small copses are mapped to the south west and south of Chilwell Dam Farm and these may be associated with old coal mining and other mineral activities in the past.

1.3 On the published provisional ALC map, sheet 112 (MAFF, 1970) the survey area is shown as grade 2. This map is of a reconnaissance nature, designed primarily for strategic planning purposes, the current survey was undertaken to provide more detailed information on the land quality of the site.

2.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

2.1 Climate data was obtained by interpolating information contained in the published agricultural climatic dataset (Met Office, 1989). This indicates that for an average site altitude of 110 m AOD, the average annual rainfall is 690 mm (27.2"). Accumulated temperature (ATO) is given at 1328 day °C. It also indicates that field capacity days are 151 and that moisture deficits for wheat and potatoes are 96 mm and 84 mm respectively. These climatic characteristics do not impose any climatic limitation on the ALC grade of the site.

Altitude and Relief

2.2 The land rises steadily from a minimum altitude of 102 m AOD adjacent to Woodhouse Way (A6002) on the eastern side of the site to a maximum altitude of 132 m AOD along the ridge on the north west boundary next to Broadoak Plantation. A shallow dry valley dissects the site to the north of Chilwell Dam Farm running in a west to easterly direction. Typically slopes are gentle (2-4°) but on the south side of the spur on the western boundary slopes are measured at 8° using a hand held clinometer.

Geology and Soils

2.3 The published 1:50 000 scale solid and drift edition geology map (sheet 125, Geological Survey of Great Britain (England and Wales) 1972) shows the area to comprise predominantly of Lower Magnesian Limestone. On the higher land to the west, small outcrops of Middle Permian Marl and Lower Mottled Sandstone are mapped which are capped by boulder clay.

2.4 No detailed soil map is available of the area but the reconnaissance 1:250 000 scale soil maps "Soils of England and Wales" (1983) shows the presence of a single soil association, the Aberford Association (*1) covering the whole site.

2.5 The current more detailed survey identified one major and two much less widespread soil types.

2.6 The main soil type occurs across the majority of the site except along the western boundary and a small area to the south of the southern copse.

2.7 To the north, east and south of Chilwell Dam Farm the topsoils typically comprise non calcareous, very slightly stony fine loamy soils over similar upper subsoils. Lower subsoils tend to be variable. Most frequently soils become lighter with depth, typically comprising coarse loamy and fine loamy textures. Occasionally well bedded sandstone is encountered at depth, typically between 70/95 cm. These soils are well drained or have slight drainage imperfections and have been assessed as wetness class *I/II*.

2.8 Along the north eastern boundary on the north side of the dry valley a stony variant of these soils is found. Sandstone slabs exceeding 6 cm in size make up in excess of 10% of the soil volume.

2.9 On the rising land to the west of Chilwell Dam Farm a slightly heavier variant of the main soil type is found. Topsoils and upper subsoils are similar to those described above (paragraph 2.7). In the lower subsoil very slightly stony slowly permeable clay is encountered between 40-70 cm. These profiles suffer from moderate drainage imperfections and have been assessed typically as wetness class III.

(*1) Aberford Association: Shallow, locally brashy, well drained calcareous fine loamy soils over limestone. Some deeper calcareous soils in colluvium.

2.10 The second soil type is found along the north west boundary and around the small copse in the south of the site. Soils typically comprise very slightly stony non calcareous fine loamy or clayey topsoils. Slowly permeable clay is encountered immediately below the topsoil and these heavy textured profiles have been assessed as wetness class IV.

2.11 The final soil type occurs in a small area on the highest land to the south west of Chilwell Dam Farm. The soils are the lightest on the site comprising very slightly stony coarse loamy or medium sandy textured topsoil over deep similar textured subsoils. These soils are free draining and have been assessed as wetness class I.

2.12 Throughout much of the site there are small localised areas of disturbed soils from old mineral activity. These soils are variable but typically consist of burnt shale and waste coal material which overlays the natural soil between 50/100 cm. Some mixing of the natural soil and the waste material has taken place.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The definitions of the ALC grades are included in Appendix 1.

3.2 Grade 2 land is mapped over the eastern half of the site. As the land rises westwards subgrade 3a is mapped with small areas of subgrade 3b land along the north western, and part of the north eastern boundary. Two further small areas of subgrade 3b land are mapped, around the small copse in the south of the site and on the steepest land to the south west of Chilwell Dam Farm. The table overleaf shows the breakdown of the grades in hectares and percentage terms.

AGRICULTURAL LAND CLASSIFICATION

Grade	Hectares	%
2	24.9	50.7
Subgrade 3a	15.2	31.0
Subgrade 3b	6.8	13.8
Woodland	0.8	2.9
Urban	1.4	1.6
TOTAL	49.1	100.0

Grade 2

3.3 Land graded 2 is associated with the fine loamy soils described in paragraph 2.7. These soils are generally assessed as wetness class I/II and the land is limited by a combination of minor winter wetness and summer droughtiness constraints.

3.4 Although more or less droughty soils do occur sporadically within the mapping unit they occupy too small an area to delineate separately. These include the disturbed soils mentioned in paragraph 2.12, which also occur within the land graded 3a.

Subgrade 3a

3.5 Land graded 3a occurs in two situations and is mapped in a broad belt to the west of the Chilwell Dam Farm.

3.6 The majority of the land graded 3a is associated with the heavier textured variant of soils as described in paragraph 2.9. Soil drainage is moderate (wetness class III), and this combined with the fine loamy topsoils excludes the land from a higher grade on wetness and workability grounds.

3.7 Subgrade 3a land also corresponds with the lightest textured soils described in paragraph 2.11. Profiles hold moderate reserves of available water for crop growth and consequently the land is limited to subgrade 3a by moderate droughtiness.

Subgrade 3b

3.8 Subgrade 3b land occurs in three situations.

3.9 Much of the area graded 3b corresponds with soils described in paragraph 2.10. These soils are heavy textured and the presence of a slowly permeable layer at a shallow depth, typically 30 cm combine to impose a significant limitation on the ability of the land to grow a wide range of crops. Thus, wetness and workability imperfections exclude the land from a higher grade.

3.10 A small area along the north eastern boundary is also graded 3b where topsoil stone volumes in excess of 6 cm exceed 10% (paragraph 2.8). The presence of stones affects crop drilling and establishment, the availability of soil, water and nutrients and war and tear on farm machinery, Thus this land is limited by topsoil stoniness and droughtiness constraints.

3.11 Thirdly a small area on the southern side of the spur on the western boundary has slopes measured at 8° thus limiting the safe and efficient use of conventional farm machinery. Thus this land has been excluded from a higher grade.

Woodland

3.12 Three small copses are mapped as woodland.

Urban

3.13 Chilwell Dam Farm and associated buildings together with the lane and other residences have been mapped as urban.

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REFERENCES

GEOLOGICAL SURVEY OF GREAT BRITAIN (England and Wales) 1972. Solid and Drift Edition Sheet 125, Derby 1:50 000 scale.

MAFF, 1970. Agricultural Land Classification Map (Provisional) Sheet 112 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. Data extracted from the published agroclimatic dataset.

SOIL SURVEY OF ENGLAND AND WALES 1983. Soils of Midland and Western England Sheet 3 1:250 000 scale.

SOIL SURVEY OF ENGLAND AND WALES 1984. Soils and their use in Midland and Western England by J M Ragg *et al* Harpenden.

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 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.