AGRICULTURAL LAND CLASSIFICATION

CHARNWOOD DISTRICT LOCAL PLAN

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1.0 ADAS Statutory Group were requested on behalf of MAFF to assess the agricultural land quality of four sites, covering 345.3 hectares in total, which are currently included in the area of search specified within the draft Charnwood District Local Plan. The sites are known as: Rothley (E/6(f)), Shelthorpe and Woodthorpe (H/01(a)), Cotes/Burton Bandalls (H/01(b)) and Replacement for Shelthorpe Golf Course (RT/03). ADAS Statutory Group surveyed the majority of sites E/6(f), H/01(a) and H/01(b) between June and September 1993. Further areas of land were added to these sites in 1995, when site RT/03 was also included. As a result further survey work was required in the extension areas and additional site in March 1995.

1.1 On the published Agricultural Land Classification Map, sheet number 121 (Provisional, 1:63 360, MAFF, 1971) the areas are shown as mainly grade 2 or grade 3 with a small area of grade 4 occurring along the river valley of site E/6(f).

1.2 Nearly all the sites have been surveyed in total or in part in the early 1980's. The land was graded predominantly 2 and 3a with smaller areas of grade 3b except at site RT/03 where larger areas of grade 3b land were mapped.

1.3 The current survey was undertaken to provide a detailed Agricultural Land Classification (ALC) using the Revised guidelines and criteria for grading the quality of agricultural land (MAFF, 1988). The resulting ALC maps supersede any previous survey information for the site.

2.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

2.1 Site specific climatic information for the four sites has been obtained by interpolating information contained in the 5 km grid dataset produced by the Meteorological Office, 1989. This information is shown in the summary overleaf. Since three of the sites (E/6(f), H/01(a) and H/01(b)) have been subject to an ALC Survey at an earlier date, a range of climatic data are presented. These relate to land included in the original survey and land included in the extension

areas. These figures are not sufficiently different to have a significant impact on ALC grade.

	E/6(f)	H/01(a)	H/01(b)	RT/03
Average Annual Rainfall (mm)	644-650	676-689	640-656	686
Altitude (m)	55-62	50-74	50-61	76
Field Capacity Days	148-150	152-156	138-143	156
MD Wheat (mm)	107-108	99-103	104-105	98
MD Potatoes (mm)	98-99	89-94	95-96	88

These climatic characteristics do not impose any overall limitation to the ALC grade of the sites. However climatic factors, specifically field capacity days and soil moisture deficits, do interact with soil factors to influence soil wetness and droughtiness limitations.

Altitude and Relief

2.2 The sites generally occupy the valley sides of the River Soar and its tributaries. They are gently sloping and fall between the overall altitude range of 40-85 m AOD.

2.3 Site E/6(f) occupies part of the floodplain of the River Soar.

2.4 Sites H/01(a) and H/01(b) adjoin river tributaries which form shallow valley features on each site.

2.5 Site RT/03 occupies slightly elevated land which gently slopes towards Wood Brook which skirts the site to the north and east.

2.6 On all sites slopes do not typically exceed 5°.

Geology and Soils

2.7 The published 1:50 000 scale solid and/or drift edition geology maps, sheets 141, 142 and 156 (Geological Survey of Great Britain, 1976 and 1975) show that the sites exhibit a geological sequence which is typical of the region. River and stream valley bottoms typically comprise alluvium with river terrace gravel exposed on the lowest valley slopes. Commonly the Triassic Keuper Marl

outcrops along the mid-slopes and this is overlain by patches of glacial sand and gravel and boulder clay on the higher land.

2.8 Depending on their size and position in the landscape, all of the sites are underlain by part or all of this geological sequence.

2.9 No detailed soil map of the region exists but the published reconnaissance scale "Soils of Midland and Western England" map (1:250 000 scale SSEW, 1983) shows the occurrence of six soil associations within the search area.

2.10 The Fladbury 1 Association (*1) is found in conjunction with alluvium deposits and covers the floodplain area of E/6(f) and the valley bottoms occurring on H/01(a). Wick 1 (*2) soils are particularly associated with the river terrace deposits and are mapped on the lower slopes of E/6(f) and H/01(b).

2.11 The remaining four soil associations, Dunnington Heath (*3), Whimple 3 (*4), Flint (*5) and Claverley (*6) broadly correspond with the Triassic Keuper Marl deposits and the overlying thin sand and gravel or boulder clay drift deposits. These soils are mapped over all of sites H/01(b) and RT/03 and more elevated parts of E/6(f) and H/01(a).

(*1) Fladbury 1 Association: Stoneless clayey soils, in places calcareous, variably affected by groundwater. Flat land. Risk of flooding.

(*2) Wick 1 Association: Deep well drained coarse loamy and sandy soils, locally over gravel. Some similar soils affected by groundwater. Slight risk of water erosion.

(*3) Dunnington Heath Association: Reddish coarse and fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging.

(*4) Whimple 3 Association: Reddish fine loamy or fine silty over clayey soils with slowly permeable subsoils and slight seasonal waterlogging. Some similar clayey soils on brows. Slowly permeable seasonally waterlogged fine loam and fine silty over clayey soils on lower slopes.

(*5) Flint Association: Reddish fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging. Some similar fine loamy soils and some slowly permeable seasonally waterlogged fine loamy over clayey soils.

(*6) Claverley Association: Slowly permeable seasonally waterlogged reddish coarse and fine loamy soils. Associated with shallow stony well drained soils on brows and steep slopes where bare rock is common.

2.12 During the detailed ADAS survey four main soil types were identified of which two are relatively light textured.

2.13.1 The lightest textured soils are associated largely with river gravels and some glacial sand and gravels and occur in the vicinity of the railway on site H/01(a). Typically these soils are freely draining (wetness class I) and comprise medium sandy loam topsoils over similar or lighter upper subsoils. Lower subsoils typically comprise loamy medium sand or medium sand. Topsoil stone content is variable ranging from very slightly stony to slightly stony (2-15%) although within these areas moderately stony patches up to 20% do occur. Subsoils also have variable stone content.

2.13.2 The second relatively light textured soil type occurs on three sites often in association with river terrace deposits. This soil type is found on the midslopes of the central part of site H/01(a). On H/01(b) this soil type is associated with glacial sand and gravel and is found on the higher land. At site RT/03 this soil type is found on lower slopes in the east of the site. These profiles are moderately well drained (wetness class I and II, occasionally III) and typically comprise very slightly stony sandy clay loam or medium clay loam topsoils (occasionally sandy silt loam or medium sandy loam), over similar or lighter subsoils. At depth heavy clay loams or clay are generally encountered although at site RT/03 medium sand was occasionally found. Locally these soils are slightly to moderately stony.

2.13.3 The third soil type comprises heavier textured soils and occurs on all sites and is associated primarily with Triassic Keuper Marl. Topsoils typically are imperfectly to moderately well drained (wetness class III and II) and comprise very slightly to slightly stony sandy clay loam or clay loam (occasionally medium sandy loam) over similar or slightly heavier upper subsoils. Lower subsoils which are also typically only slightly stony comprise clay or sandy clay. Slightly stonier variants with slightly/ moderately stony topsoils occur on the higher land of sites E/6(f) and H/01(b).

2.13.4 The fourth soil type comprises the heaviest textured soils and occurs on alluvial deposits in river valleys on sites E/6(f), H/01(a) and H/01(b) and also in areas of boulder clay and Keuper Marl deposits where profiles overlie slowly permeable clay at shallow depths on sites H/01(a) and RT/03. These soils are typically imperfectly to poorly drained (wetness class III/IV) and comprise very slightly stony heavy clay loam or clay topsoils (occasionally heavy silty clay loam or silty

clay) over slowly permeable clay from 30-40 cm. On the western end of site H/01(a) a wide range of topsoils textures occur due to the presence of a more complex geological pattern with thin drift deposits over the clay.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The definitions of the Agricultural land Classification (ALC) grades are included in Appendix 1.

3.2 The table below shows the ALC grades for each of the survey sites.

SITE	GRADE	HECTARES	PERCENTAGE
E/6(f) ROTHLEY	2	11.5	30
	3a	8.4	22
	3b	1.7	5
	4	10.1	27
	Urban	0.5	1
	Non Agricultural	5.6	15
	TOTAL	37.8	100
H/01(a) SHELTHORPE & WOODTHORPE	2	18.2	18
	3a	50.7	51
	3b	19.5	20
	Urban	3.0	3
	Non Agricultural	7.2	7
	Agr. Buildings	1.0	1
	TOTAL	99.6	100

H/01(b) COTES/BURTON BANDALLS	2	12.7	8
	3a	54.3	33
	3b	85.8	52
	Urban	0.3	neg
	Non Agricultural	10.5	6
	Agr. Buildings	1.5	1
	TOTAL	165.1	100
RT/03 REPLACEMENT FOR SHELTHORPE GOLF COURSE	2	2.7	6
	3a	5.7	14
	3b	33.8	79
	Urban	0.1	neg
	Non Agricultural	0.3	1
	Woodland	0.1	neg
	Open water	0.1	neg
	TOTAL	42.8	100

ROTHLEY E/6(f)

Grade 2

3.3 Land graded 2 is mapped on the midslopes of the site corresponding with the imperfectly to moderately well drained variant of fine loamy over clayey soils described in paragraph 2.13.3. Wetness class is assessed as II/III and land is limited by minor winter wetness and workability imperfections. Where soils are particularly light or stony the land is also excluded from grade 1 by minor topsoil *stoniness and slight droughtiness imperfections.*

Subgrade 3a

3.4 This occurs in two areas, firstly, on the upper slopes of the site, grade 3a is associated with the stonier variant of soils described in 3.3 above and therefore much of this land is limited by droughtiness. Additionally topsoil stoniness ≥2 cm

was measured at 11-13% of soil volume within this area. The presence of stone affects crop drilling and establishment, the availability of soil water and nutrients, and wear and tear on farm machinery, thus limiting the land to subgrade 3a.

3.5 Secondly, 3a is mapped on the lower slopes corresponding with the slightly heavier less stony variant of soils described in paragraph 2.13.3. The soils are typically slowly permeable from 45/55 cms and the land is consequently limited to 3a by moderate wetness and workability limitations.

Subgrade 3b

3.6 Land graded 3b is associated with the stoniest variant of land described in paragraph 2.13.3. This land is mapped in a small area in the south west corner of the site. Topsoils stone volumes in excess of 2 cm in size were measured at typically 20% excluding land from 3a.

3.7 A small area of land to the northwest of the Rothley Lodge was restricted to subgrade 3b due to severe compaction in the subsoil horizons. This compaction may have been formed during the construction of the adjacent A6.

Grade 4

3.8 Land graded 4 occurs in the floodplain of the River Soar. These soils are associated with the poorly drained heavy textured clayey soils described in paragraph 2.13.4. The overriding limitation on this land is flooding, which frequently occurs in winter thus limiting the types of crops that can be grown (land use restricted to grass) and causing problems of soil management.

Non Agricultural

3.9 Areas of cricket bat willow plantation, woodland and scrubland are mapped as non agricultural.

Urban

3.10 A disused farm cottage and Rothley Lodge farm buildings are mapped as urban.

SHELTHORPE & WOODTHORPE H/01(a)

Grade 2

3.11 Land graded 2 is mapped through the centre of the site to the south of Shelthorpe Cemetery and west of Woodthorpe village. Two soil types occur in the area graded 2.

3.12 Firstly are soils described in paragraphs 2.13.3 which comprise fine and coarse loamy topsoils over similar or heavier subsoils. These soils are slowly permeable at depth (wetness class II) and are restricted to grade 2 by wetness and workability limitations.

3.13 Secondly are soils described in paragraph 2.13.2 which comprise fine and coarse loamy topsoils over lighter textured subsoils. These soils are well drained (wetness class I) and hold moderately good reserves of available water for crop growth. Slight droughtiness imperfections and occasional topsoil stone limitation excludes this land from a high grade.

Subgrade 3a

3.14 Subgrade 3a land is mapped over much of the south western and north eastern parts of the site. It occurs in two main situations:

3.15 Land in the south west of the site is associated with imperfectly drained variants of soils described in paragraph 2.13.3. Soils are typically fine loamy over clayey and are assessed as wetness class III. The two factors of moderately heavy topsoil texture and imperfect drainage combine to restrict this land from a higher grade.

3.16 Land in the north east of the site, in the vicinity of the steam railway comprise fine or coarse loamy soils which are described in paragraph 2.13.1. Soils are well drained (wetness class I occasionally II). The combination of light texture and slight to moderate profile stone results in a moderate droughtiness limitation. In small areas topsoil stoniness also constitute an additional limitation to land quality. Although individual auger borings in this area were noted which are or approach grade 2, these do not occur sufficiently extensively to merit separate delineation.

Subgrade 3b

3.17 Land mapped as 3b is associated with soils described in 2.13.4 and occurs in 3 locations within the plan area. The extreme north of the site, the valley to the north of Woodthorpe and to the south and southwest of the golf course. All these soils are poorly drained (wetness class IV) and comprise fine loamy topsoils immediately overlying clayey subsoils. The combination of heavy topsoil texture and poor soil drainage restrict the land from a higher grade on wetness and workability grounds.

Non Agricultural

3.18 A golf course, small play area, informal gardens (semi-derelict) and an archery range are mapped as non agricultural.

Urban

3.19 Buildings and associated ground and the workshops at Bull in the Hollow Farm are mapped as urban, together with houses and gardens on the western side of Woodthorpe village. Additionally the road and railway embankment in the west of the site are mapped as urban.

3.20 Agricultural Buildings

This comprises a barn and associated outbuildings east of Park Grange and associated outbuildings surrounding Grange Farm at Woodthorpe.

COTES/BURTON BANDALLS H/01(b)

Grade 2

3.21 A strip of land in the north of the site and land north of Mere Hill Spinney have been graded 2. These correlate with the free draining lighter textured soils described in paragraph 2.13.2 together with deep sandy clay loam soils described in paragraph 2.13.3. These light textures combined with profile stoniness in the deep sandy clay loam soil variants impose a minor limiting effect on the water holding capacity of the soil. As a result slight droughtiness imperfections exclude the land from grade 1. Although individual profiles of grade 1 were noted in the

northern area they do not occur in sufficiently discrete areas to permit separate delineation.

Subgrade 3a

3.22 Land mapped as subgrade 3a occurs in the band running through the centre of the site, to the south of Hoton Hill Farm, and in three smaller areas in the west, south west and an area to the east of the site. Where soils correspond with the imperfectly drained variants of those described in paragraph 2.13.3 these profiles show evidence of wetness in the lower subsoil (wetness class III, occasionally II). This factor in combination with topsoil textures imposes a moderate wetness and workability limitation which restricts land quality to subgrade 3a. Although better drained and lighter textured soil variants do occur to the south of Park Farm and Hoton Hills Farm, they are excluded from grade 2 by topsoil stoniness imperfections.

Subgrade 3b

3.23 Land graded 3b is associated with the heavier textured and more poorly drained variants of soils described in paragraph 2.13.3 together with the clayey soils described in paragraph 2.13.4. These profiles are slowly permeable from a shallow depth (wetness class III and IV). This factor in combination with heavy textured topsoils imposes a moderate wetness and workability limitation which restricts land quality to subgrade 3b.

3.24 Land on the top of the hill to the east of the site, northwest of Loughborough Road is also limited to subgrade 3b by moderately stony topsoils.

Non Agricultural

3.25 Mere Hill Spinney and a thin belt of woodland and scrub running through the centre of the site, adjacent to the stream have been mapped as non agricultural. Tree planted areas in the east and west of the site are also mapped as non agricultural.

Urban

3.26 In the west of the site are the houses and gardens of Park Farm.

Agricultural Buildings

3.27 Surrounding Park Farm, to its south west and in the south of the site are several farm buildings.

REPLACEMENT FOR SHELTHORPE GOLF COURSE

Grade 2

3.28 Grade 2 land occurs in a small area in the northeast of the site and corresponds with the well and moderately well drained light textured soils described in paragraph 2.13.2. Wetness class is assessed as I or II. Minor winter wetness imperfections and/or slight summer droughtiness constraints exclude this land from grade 1.

Subgrade 3a

3.29 The strip of subgrade 3a land in the east of the site is associated with the less well drained or heavier fine loamy over clayey soils described in paragraph 2.13.3. Soils are imperfectly drained (wetness class III or occasionally II) and this combined with topsoil textures imposes moderate wetness and workability limitations on the land.

Subgrade 3b

3.30 The majority of the site has been graded 3b and corresponds to the poorly drained fine loamy over clayey soils associated with the Keuper Marl deposits described in paragraph 2.13.4. Topsoil textures combined with the poor soil drainage (wetness class III and IV) 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.

Non Agricultural

3.31 In the west of the site a small area of land is covered by scrub and has been mapped as non agricultural.

Woodland

3.32 A small area of woodland is present in the southeast of the site.

Open Water

3.33 Three ponds are present on the site.

Urban

3.34 A cover for water distribution facilities with associated concrete fixings are mapped as urban in a small area in the centre of the site.

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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 (eg. 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.