AGRICULTURAL LAND CLASSIFICATION; M1, JUNCTION 26, NOTTINGHAM; SITE 1

1.0 BACKGROUND

1.1 The site covers an area of 158.9 hectares and is one of a series of sites close to the M1 motorway being examined in connection with the Nottingham Local Plan.

1.2 The site is bounded to the east by the A 6002 road, to the north by Strelley Hall Park and hamlet, to the west by the M1 motorway and to the south by agricultural land. The site contains significant non-agricultural land, principally access tracks, farm buildings, woodland and, in the centre of the site, a reservoir.

1.3 ADAS Statutory Resource Planning Team undertook a reconnaissance Agricultural Land Classification (ALC) survey of the site during February 1996. Information was collected from 47 auger borings at a survey intensity of about 3.4 ha, to a depth of 120 cm or shallower if an impenetrable layer was encountered. Subsoil conditions were assessed from six inspection pits representative of the main soil types encountered.

1.4 On the published provisional 1:63 360 scale ALC map, Sheet 112 (MAFF, 1970) the north-eastern quarter of the site is mapped as Grade 2. The western edge of the site is mapped as Grade 4 and the remainder is shown as Grade 3 interspersed with three small blocks of Non-agricultural land. However, this map is of a reconnaissance nature and since its publication the ALC system has been revised (MAFF, 1988). Since revision, a reconnaissance survey of the land immediately to the south of Site 1 (ADAS, 1995) indicates Subgrades 3a and 3b land. The current survey was undertaken to provide specific soil and ALC information about the site itself.

1.5 At the time of the survey the agricultural area of the site was mainly in arable use, principally winter cereals and oilseed rape. Permanent grassland occurs in parts of the north, south and centre of the site.

2.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

2.1 Climate criteria are considered when classifying land as these may have an overriding limitation in terms of the agricultural use of the land. The main parameters used in the assessment of the overall climate limitation are average annual rainfall (as a measure of overall wetness) and accumulated temperature (day °C Jan-June, as a measure of the relative warmth of an area).

2.2 A detailed assessment of the prevailing climate for the site has been made by interpolation from the 5 km grid dataset produced by the Meteorological Office (Met. Office, 1989). The details are given in Table 1 and show that there is no overall climatic limitation affecting this site.

Table 1 : Climatic Interpolation

Grid Reference	SK 508 413
Altitude (m, AOD)	100
Accumulated Temperature Day °C, Jan-June	1340
Average Annual Rainfall (mm)	682
Moisture Deficit, Wheat (mm)	98
Moisture Deficit, Potatoes (mm)	86
Field Capacity Days	147
Overall Climatic Grade	1

Altitude and Relief

2.3 Catstone Hill in the centre of the site is the highest land, at 125 m AOD. From here the land slopes south-eastwards and north-westwards. A small dry valley running westwards to Oldmoor Pond (just across the western boundary of the

site) bisects the north-west slopes. The lowest land, at 75 m AOD, is in the south-east corner of the site. Generally, the site is part of an undulating plateau, but only along the southern edge of Catstone Hill are gradients sufficiently steep (11° to 15°) to limit agricultural use, both through an increasing risk to the safe and efficient operation of certain farm machinery and through an increased potential for soil erosion..

Geology and Soils

2.4 The 1:50 000 scale geology map (Geological Survey, 1972) shows the central ridge including Catstone Hill to comprise Permo-Triassic Lower Mottled Sandstone with, in places, a cap of Pleistocene Boulder Clay. To the north-east of this ridge, and to a limited extent to the north-west and south, occurs Permo-Triassic Lower Magnesian Limestone. Elsewhere, in the south-east and west of the site, occurs Carboniferous Middle Coal Measures.

2.5 There is no published detailed soils information for the site. The reconnaissance soil survey map for the area (Soil Survey, 1983) shows the north-eastern part of the site to comprise soils of the Aberford association while the south of the site has soils belonging to Dale association (*). In the north-west, the site is shown to contain opencast coal workings restored with slowly permeable fine loamy and clayey soils.

2.6 The current survey of the site shows the presence of four main soil types. The first soil type occurs in the centre of the site. Typically, a dark brown medium

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(*) Aberford association: Shallow, locally brashy, well-drained calcareous fine loamy soils over Permian, Jurassic and Eocene limestone. Some deeper soils in colluvium.

Dale association: Slowly permeable, seasonally waterlogged, clayey, fine loamy over clayey and fine silty soils derived from Carboniferous and Jurassic clay and shale.

sandy loam topsoil to about 30 / 35 cm overlies a strong brown medium sandy loam upper subsoil. The lower subsoil, typically below 60 / 70 cm, is a yellowish red loamy medium sand. The soil is non-calcareous and very slightly stony throughout. It is well-drained and is assessed as Wetness Class I.

2.7 The second soil type occurs to a limited extent in both the north and south of the site. Characteristically, a reddish brown medium clay loam topsoil to 30 cm overlies a brown clay with distinct grey and ochreous mottles. Below 55 / 65 cm occurs a lower subsoil of dusky red clay with gleyed ped faces. Both of the subsoil clay horizons have prismatic structures and are assessed as slowly permeable and the soil is classified as Wetness Class IV. The soil is non-calcareous and very slightly stony throughout.

2.8 The third soil type occurs in the east of the site. The soil is similar to that described above but differs essentially by having a permeable heavy clay loam upper subsoil. Consequently, the soil is classified as Wetness Class III.

2.9 The fourth soil type occurs in the west of the site. The soil profile is disturbed, having been reinstated above opencast coal workings, and consists of 25 / 35 cm of medium or heavy clay loam topsoil overlying a slowly permeable clay subsoil to at least 65 cm, below which occurs impenetrable overburden. The soil is non-calcareous and is classified as Wetness Class IV.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The land has been classified using the guidelines contained in the Agricultural Land Classification of England and Wales (MAFF, 1988). A breakdown of the grades found on the site is given in Table 2 and a description of each grade is given in Appendix 1. At this site the factors which primarily determine grading are soil droughtiness (a function of soil depth, texture, structure and stoniness relative to the crop adjusted moisture deficits in the area) and soil wetness (a function of climate and soil permeability).

Table 2. Agricultural Land Classification

Grade	ha	%
2	27.9	18
3a	47.5	30
3b	63.4	40
4	2.4	1
Other land	17.7	11
TOTAL	158.9	100.0

Grade 2

3.2 The land having the sandy loam over loamy sand soils (para. 2.6) is mapped as grade 2. This land has a slight droughtiness limitation in that moisture balance calculations show that the available water capacity within the soil profiles is limiting for the requirements of certain deeper rooting crops.

Subgrade 3a

3.3 Land with the clay loam over clay soils (para. 2.8) is mapped as Subgrade 3a on account of a moderate wetness and workability restriction. The soils have medium clay loam topsoils and have been assessed as Wetness Class III. The land will lie wet for significant periods and careful management will be necessary to prevent soil structural damage.

Subgrade 3b

3.4 Land with slowly permeable clay immediately beneath the topsoil (paras. 2.7 and 2.9) is mapped as Subgrade 3b on account of a moderately severe wetness and workability restriction. The soils are classified as Wetness Class IV. The

land will lie wet for long periods and soil management will require careful control and timeliness to avoid serious structural damage.

Other land

3.5 Non-agricultural land within the site consists of access tracks, farm buildings, woodland and a reservoir.

March 1996

Resource Planning Team
ADAS Cambridge

REFERENCES

ADAS Huntingdon Statutory Centre, 1995. Agricultural land Classification, City of Nottingham Draft Local Plan, Reconnaissance Survey part of Site 2.

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

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

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.

AGRICULTURAL LAND CLASSIFICATION; M1, JUNCTION 26, NOTTINGHAM; SITE 2

1.0 BACKGROUND

1.1 The site covers an area of 15.7 hectares and is one of a series of sites close to the M1 motorway being examined in connection with the Nottingham Local Plan.

1.2 The site comprises one triangular field and is bounded to the east by the B 600 road, to the south by the A 610 road and to the west by the M1 motorway.

1.3 ADAS Statutory Resource Planning Team undertook a reconnaissance Agricultural Land Classification (ALC) survey of the site during February 1996. Information was collected from 8 auger borings at a survey intensity of about 2.0 ha, to a depth of 120 cm or shallower if an impenetrable layer was encountered. Subsoil conditions were inferred using the information gained from three inspection pits located at nearby Sites 4 and 7 (ADAS, 1996), shown to have similar soil types to Site 2.

1.4 On the published provisional 1:63 360 scale ALC map, Sheet 112 (MAFF, 1970) all the site is mapped as Grade 2. However, this map is of a reconnaissance nature and since its publication the ALC system has been revised (MAFF, 1988). The current survey was undertaken, therefore, to provide more site specific details.

1.5 At the time of the survey the field was growing winter cereals.

2.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

2.1 Climate criteria are considered when classifying land as these may have an overriding limitation in terms of the agricultural use of the land. The main parameters used in the assessment of the overall climate limitation are average annual rainfall (as a measure of overall wetness) and accumulated temperature (day °C Jan-June, as a measure of the relative warmth of an area).

2.2 A detailed assessment of the prevailing climate for the site has been made by interpolation from the 5 km grid dataset produced by the Meteorological Office (Met. Office, 1989). The details are given in Table 1 and show that there is no overall climatic limitation affecting this site.

Table 1 : Climatic Interpolation

Grid Reference	SK 518 442
Altitude (m, AOD)	90
Accumulated Temperature Day °C, Jan-June	1350
Average Annual Rainfall (mm)	678
Moisture Deficit, Wheat (mm)	99
Moisture Deficit, Potatoes (mm)	88
Field Capacity Days	151
Overall Climatic Grade	1

Altitude and Relief

2.3 The land slopes north-easwards from a plateau at 98 m AOD in the south-west of the site. The lowest land, at about 77 m AOD, lies adjacent to the eastern boundary. Slopes nowhere exceed 7° and are not limiting in ALC terms.

Geology and Soils

2.4 The 1:50 000 scale geology map (Geological Survey, 1972) shows all of the site to be underlain by Permo-Triassic Lower Magnesian Limestone.

2.5 There is no published detailed soils information for the site. The reconnaissance soil survey map for the area (Soil Survey, 1983) shows all the site to comprise soils of the Aberford association, these being shallow, locally brashy, well-drained calcareous fine loamy soils over Permian, Jurassic and Eocene limestone.

2.6 The current survey of the site shows the presence of a single main soil type. Typically, the topsoil to 30 / 35 cm is a very slightly stony, dark brown or dark reddish brown medium sandy loam or medium clay loam. The upper subsoil is a very slightly stony, yellowish red or reddish brown, medium sandy loam or medium clay loam. The lower subsoil, usually starting within 45 / 70 cm, is a brown or yellowish red loamy medium sand containing abundant weathering sandstone fragments. The soil is predominantly non-calcareous, well drained and is classified as Wetness Class I.

2.7 The soil described above covers most of the site. However, there occur sporadically a few profiles where the sandstone is encountered below 70 cm or where the subsoil contains a dark red, slowly permeable clay.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The land has been classified using the guidelines contained in the Agricultural Land Classification of England and Wales (MAFF, 1988). A description of each grade is given in Appendix 1. At this site the factor which primarily determines grading is the soil droughtiness, which is a function of soil depth, texture, structure and stoniness relative to the crop adjusted moisture deficits in the area.

Subgrade 3a

3.2 The whole site, 15.7 ha, is mapped as Subgrade 3a. The land having the predominant loamy over sandy soils (para. 2.6) has a moderate droughtiness limitation in that moisture balance calculations show that the available water capacity within the soil profiles is limiting for the requirements of certain crops. Within the Subgrade 3a land occur small areas of Grade 2 land where there is a greater depth of soil above the sandstone and small areas of Subgrade 3b land where slowly permeable clay underlies the topsoil (para. 2.7). However, these sporadic occurrences cannot be separately delineated at the scale of survey.

March 1996

Resource Planning Team
ADAS Cambridge

REFERENCES

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

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.

AGRICULTURAL LAND CLASSIFICATION; M1, JUNCTION 26, NOTTINGHAM; SITE 3

1.0 BACKGROUND

1.1 The site covers an area of 35.6 hectares and is one of a series of sites close to the M1 motorway being examined in connection with the Nottingham Local Plan.

1.2 The site is bounded to the east by the A 6002 road, to the north by a dismantled railway track, to the west by the M1 motorway and to the south by housing along the B 600 road.

1.3 ADAS Statutory Resource Planning Team undertook a reconnaissance Agricultural Land Classification (ALC) survey of the site during February 1996. Information was collected from 14 auger borings at a survey intensity of about 2.5 ha, to a depth of 120 cm or shallower if an impenetrable layer was encountered. Subsoil conditions were inferred using the information gained from three inspection pits located at nearby Sites 4 and 7 (ADAS, 1996), shown to have similar soil types to Site 3.

1.4 On the published provisional 1:63 360 scale ALC map, Sheet 112 (MAFF, 1970) the northern half of the site is mapped as Grade 3 and the southern half is mapped as Grade 2. However, this map is of a reconnaissance nature and since its publication the ALC system has been revised (MAFF, 1988). The current survey was undertaken, therefore, to provide more site specific details.

1.5 There are two small areas of woodland in the north and south-east of the site. At the time of the survey most of the remainder of the site was under winter cereals, but the field to the west of LowWood and the fields behind the housing to the south-west of the site were grassland.

2.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

2.1 Climate criteria are considered when classifying land as these may have an overriding limitation in terms of the agricultural use of the land. The main parameters used in the assessment of the overall climate limitation are average annual rainfall (as a measure of overall wetness) and accumulated temperature (day °C Jan-June, as a measure of the relative warmth of an area).

2.2 A detailed assessment of the prevailing climate for the site has been made by interpolation from the 5 km grid dataset produced by the Meteorological Office (Met. Office, 1989). The details are given in Table 1 and show that there is no overall climatic limitation affecting this site.

Table 1 : Climatic Interpolation

Grid Reference	SK 520 445
Altitude (m, AOD)	77
Accumulated Temperature Day °C, Jan-June	1365
Average Annual Rainfall (mm)	671
Moisture Deficit, Wheat (mm)	100
Moisture Deficit, Potatoes (mm)	90
Field Capacity Days	149
Overall Climatic Grade	1

Altitude and Relief

2.3 The land slopes gently from 84 m AOD in the north-west of the site to 68 m AOD in the south-east corner. A shallow valley runs from the centre of the site south-eastwards. Slopes nowhere exceed 3° and are not limiting in ALC terms.

Geology and Soils

2.4 The 1:50 000 scale geology map (Geological Survey, 1972) shows most of the site to be underlain by lower Permo-Triassic rocks. The north-east of the site comprises Middle Permian Marl whilst elsewhere the site is underlain by Lower Magnesian Limestone and, in the small valley floor, Pleistocene and Recent River Gravels.

2.5 There is no published detailed soils information for the site. The reconnaissance soil survey map for the area (Soil Survey, 1983) shows the whole site to comprise soils of the Brockhurst 2 association, these being slowly permeable, seasonally waterlogged, reddish, fine loamy over clayey and clayey soils derived from Permo-Triassic mudstone and alluvium.

2.6 The current survey of the site shows the presence of three main soil types. The distribution of these soils broadly correlates with the aforementioned geology.

2.7 The first soil type occurs in the north and north-east of the site. Characteristically, a dark brown, very slightly or slightly stony, medium or heavy clay loam topsoil to 35 cm overlies a strong brown clay with common distinct grey and ochreous mottles. Below 45 cm occurs a lower subsoil of reddish brown to dusky red clay with gleyed ped faces. Both of the subsoil clay horizons are virtually stoneless, have prismatic structures and are assessed as slowly permeable. The soil is non-calcareous and is classified as Wetness Class IV.

2.8 The second soil type is widespread in the west and south-west of the site. The topsoil, to 25 / 30 cm, is a dark brown, very slightly stony, medium sandy loam, medium clay loam or sandy clay loam. It typically overlies a reddish brown or dark reddish brown, very slightly stony, medium sandy loam or medium clay loam upper subsoil. At depths usually between 35 / 50 cm the profiles become yellowish red loamy sand containing many weathering

sandstone fragments. Fissured sandstone rock itself occurs at 45 / 75 cm. The soil is predominantly non-calcareous, well drained and is classified as Wetness Class I.

2.9 The third soil type is derived from alluvium and is typically deep, very slightly stony, non-calcareous, loamy and well drained. It occurs within the small valley in the south-east of the site. A dark brown, medium clay loam topsoil to 30 / 35 cm overlies yellowish red to strong brown sandy loam, sandy clay loam, clay loam and silty clay loam subsoil horizons. Occasionally, gravelly medium sand may occur below 95 cm. The soil is classified as Wetness Class I.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The land has been classified using the guidelines contained in the Agricultural Land Classification of England and Wales (MAFF, 1988). A breakdown of the grades found on the site is given in Table 2 and a description of each grade is given in Appendix 1. At this site the factors which primarily determine grading are soil droughtiness (a function of soil depth, texture, structure and stoniness relative to the crop adjusted moisture deficits in the area) and soil wetness (a function of climate and soil permeability).

Table 2. Agricultural Land Classification

Grade	ha	%
1	3.5	10
3a	15.2	43
3b	14.9	42
Other land	2.0	5
TOTAL	35.6	100.0

Grade 1

3.2 Land having the deep loamy soils (para. 2.9) is mapped as Grade 1. The soils are well drained and moisture balance calculations show that available water capacities are sufficient for crop growth. There are no or very minor limitations to the use of this land.

Subgrade 3a

3.3 The land having the loamy soils over sandstone (para. 2.8) is mapped as Subgrade 3a. Lower subsoils are moderately or very stony and the depth to hard sandstone, - the limit of rooting, is variable over short distances. Moisture balance calculations show that the available water capacity within the soil profiles is limiting for the requirements of certain crops and in general the land has a moderate droughtiness limitation. However, because of the variable soil depth profiles with a greater droughtiness limitation, Subgrade 3b, do occur, but these cannot be accurately delineated at the scale of survey. Likewise, a few less droughty profiles, Grade 2, may also occur locally.

Subgrade 3b

3.4 Land with the clayey soils (para. 2.7) is mapped as Subgrade 3b on account of a moderately severe wetness and workability restriction. The soils have medium or heavy clay loam topsoils and have been assessed as Wetness Class IV. The land will lie wet for long periods and soil management will require careful control to avoid serious structural damage.

Other land

3.5 Non-agricultural land within the site consists of a small disused pit and Low Wood and the woodland in the south-east of the site.

March 1996

Resource Planning Team
ADAS Cambridge

REFERENCES

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

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.

AGRICULTURAL LAND CLASSIFICATION; M1, JUNCTION 26, NOTTINGHAM; SITE 4

1.0 BACKGROUND

1.1 The site covers an area of 55.6 hectares and is one of a series of sites close to the M1 motorway being examined in connection with the Nottingham Local Plan.

1.2 The site is bounded to the east by the A 6002 road, to the north-east by housing at the edge of Nottingham, to the south by a dismantled railway track, to the west by New Farm Wood and to the north by woodland (New Farm Wood and Seller's Wood) and agricultural land.

1.3 ADAS Statutory Resource Planning Team undertook a reconnaissance Agricultural Land Classification (ALC) survey of the site during February 1996. Information was collected from 18 auger borings at a survey intensity of about 2.5 ha, to a depth of 120 cm or shallower if an impenetrable layer was encountered. Subsoil conditions were assessed from two inspection pits representative of the main soil types encountered.

1.4 On the published provisional 1:63 360 scale ALC map, Sheet 112 (MAFF, 1970) the majority of the site is mapped as Grade 3 with a small area of Grade 2 land in the south-west corner and small areas of Non-agricultural land in the west (New Farm Wood) and east. However, this map is of a reconnaissance nature and since its publication the ALC system has been revised (MAFF, 1988). The current survey was undertaken, therefore, to provide more site specific details.

1.5 At the time of the survey the north-east and east of the site was under grass. The remainder of the site, apart from New Farm Wood, High Wood (in the centre of the site) and a part of Seller's Wood, was under winter cereals.

2.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

2.1 Climate criteria are considered when classifying land as these may have an overriding limitation in terms of the agricultural use of the land. The main parameters used in the assessment of the overall climate limitation are average annual rainfall (as a measure of overall wetness) and accumulated temperature (day °C Jan-June, as a measure of the relative warmth of an area).

2.2 A detailed assessment of the prevailing climate for the site has been made by interpolation from the 5 km grid dataset produced by the Meteorological Office (Met. Office, 1989). The details are given in Table 1 and show that there is no overall climatic limitation affecting this site.

Table 1 : Climatic Interpolation

Grid Reference	SK 519 450
Altitude (m, AOD)	85
Accumulated Temperature Day °C, Jan-June	1355
Average Annual Rainfall (mm)	677
Moisture Deficit, Wheat (mm)	99
Moisture Deficit, Potatoes (mm)	89
Field Capacity Days	152
Overall Climatic Grade	1

Altitude and Relief

2.3 The site forms part of a gently undulating plateau at 75 - 90 m AOD. The higher land occurs in the centre and east of the site while the slightly lower ground occurs in the south-west and north-west. Slopes nowhere exceed 5° and are not limiting in ALC terms.

Geology and Soils

2.4 The 1:50 000 scale geology map (Geological Survey, 1972) shows the site to be predominantly underlain by lower Permo-Triassic rocks. In the centre and east of the site, more or less coincident with the higher ground, occurs Lower Mottled Sandstone while in the north, south and west occurs Middle Permian Marl. A small area of Pleistocene Boulder Clay overlies the sandstone in the centre of the site.

2.5 There is no published detailed soils information for the site. The reconnaissance soil survey map for the area (Soil Survey, 1983) shows the northern part of the site to comprise soils of the Aberford association while the southern part of the site has soils belonging to the Brockhurst 2 association (*).

2.6 The current survey of the site shows the presence of two main soil types. The distribution of these soils broadly correlates with the aforementioned topography and underlying geology.

2.7 The first soil type occurs in the centre and east of the site. Typically, a dark brown medium sandy loam topsoil to about 30 / 35 cm overlies a reddish brown loamy medium sand upper subsoil. The lower subsoil, below 70 / 90 cm, is typically a reddish brown medium sand although loamy medium sand textures continue to 120+ cm in some profiles. The soil is non-calcareous and very slightly stony throughout. It is well-drained and is assessed as Wetness Class I.

(*) Aberford association: Shallow, locally brashy, well-drained calcareous fine loamy soils over Permian, Jurassic and Eocene limestone. Some deeper soils in colluvium.

Brockhurst 2 association: Slowly permeable, seasonally waterlogged, reddish, fine loamy over clayey and clayey soils derived from Permo-Triassic mudstone and alluvium.

2.8 The second soil type occurs in the north, south and west of the site. Characteristically, a brown medium clay loam topsoil to 30 cm overlies a brown, very pale brown or light reddish brown clay with many distinct grey and ochreous mottles. Below 45 / 60 cm occurs a lower subsoil of dusky red clay with gleyed ped faces. Both of the subsoil clay horizons have prismatic structures and are assessed as slowly permeable and the soil is classified as Wetness Class IV. The soil is non-calcareous and virtually stoneless.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The land has been classified using the guidelines contained in the Agricultural Land Classification of England and Wales (MAFF, 1988). A breakdown of the grades found on the site is given in Table 2 and a description of each grade is given in Appendix 1. At this site the factors which primarily determine grading are soil droughtiness (a function of soil depth, texture, structure and stoniness relative to the crop adjusted moisture deficits in the area) and soil wetness (a function of climate and soil permeability).

Table 2. Agricultural Land Classification

Grade	ha	%
3a	27.7	50
3b	19.1	34
Other land	8.8	16
TOTAL	55.6	100.0

Subgrade 3a

3.2 The land having the coarse loamy over sandy soils (para. 2.7) is mapped as Subgrade 3a. The land has a moderate droughtiness limitation in that moisture balance calculations show that the available water capacity within the soil profiles is limiting for the requirements of certain deeper rooting crops.

Subgrade 3b

3.3 Land with the clayey soils (para. 2.8) is mapped as Subgrade 3b on account of a moderately severe wetness and workability restriction. The soils have predominantly medium clay loam topsoils and are Wetness Class IV. The land will lie wet for long periods and soil management will require careful control to avoid serious structural damage.

Other land

3.4 Non-agricultural land within the site consists of High Wood, New Farm Wood and parts of Seller's Wood.

March 1996

Resource Planning Team
ADAS Cambridge

REFERENCES

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

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.

AGRICULTURAL LAND CLASSIFICATION, M1, JUNCTION 26, NOTTINGHAM; SITE 5

1.0 BACKGROUND

1.1 The site covers an area of 40.6 hectares and is one of a series of sites close to the M1 motorway being examined in connection with the Nottingham Local Plan.

1.2 The site is bounded to the east and south-east by Seller's Wood, to the south-west by New Farm Wood and the M1 motorway, to the west by agricultural land and to the north by Bulwell Wood and agricultural land. The buildings of New Farm lie in the centre of the site and a dismantled railway track runs across the site from west to east.

1.3 ADAS Statutory Resource Planning Team undertook a reconnaissance Agricultural Land Classification (ALC) survey of the site during February 1996. Information was collected from 16 auger borings at a survey intensity of about 2.5 ha, to a depth of 120 cm or shallower if an impenetrable layer was encountered. Subsoil conditions were assessed from one inspection pit on-site and from using the information gained from four pits located at adjacent Sites 4, 7 and 8 (ADAS, 1996), shown to have similar soil types to Site 5.

1.4 On the published provisional 1:63 360 scale ALC map, Sheet 112 (MAFF, 1970) most of the site is mapped as Grade 2. Two small areas of Grade 3 land are shown in the east and north-west of the site. However, this map is of a reconnaissance nature and since its publication the ALC system has been revised (MAFF, 1988). The current survey was undertaken, therefore, to provide more site specific details.

1.5 At the time of the survey all the land was in agricultural use, predominantly winter cereals but with a small area of set-aside in the east of the site.

2.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

2.1 Climate criteria are considered when classifying land as these may have an overriding limitation in terms of the agricultural use of the land. The main parameters used in the assessment of the overall climate limitation are average annual rainfall (as a measure of overall wetness) and accumulated temperature (day °C Jan-June, as a measure of the relative warmth of an area).

2.2 A detailed assessment of the prevailing climate for the site has been made by interpolation from the 5 km grid dataset produced by the Meteorological Office (Met. Office, 1989). The details are given in Table 1 and show that there is no overall climatic limitation affecting this site.

Table 1 : Climatic Interpolation

Grid Reference	SK 517 455
Altitude (m, AOD)	90
Accumulated Temperature Day °C, Jan-June	1349
Average Annual Rainfall (mm)	685
Moisture Deficit, Wheat (mm)	98
Moisture Deficit, Potatoes (mm)	88
Field Capacity Days	155
Overall Climatic Grade	1

Altitude and Relief

2.3 The land is part of a gently undulating plateau that slopes gradually from west to east. The highest point is 97 m AOD in the west and the lowest point is 73 m AOD in the east. Slopes nowhere exceed 3° and are not limiting in ALC terms.

Geology and Soils

2.4 The 1:50 000 scale geology map (Geological Survey, 1972) shows the site to be underlain by Permo-Triassic rocks, namely Middle Permian Marl in the east and Lower Magnesian Limestone elsewhere.

2.5 There is no published detailed soils information for the site. The reconnaissance soil survey map for the area (Soil Survey, 1983) shows all the site to comprise soils of the Aberford association, these being shallow, locally brashy, well-drained calcareous fine loamy soils over Permian, Jurassic and Eocene limestone.

2.6 The current survey of the site shows the presence of four main soil types. The first soil type occurs mainly in the east of the site but also to a limited extent in the south-west. Characteristically, a brown or dark brown, very slightly stony, medium or heavy clay loam topsoil to 25 / 30 cm overlies a strong brown clay with common distinct grey and ochreous mottles. Below 50 / 60 cm occurs a lower subsoil dark red or dusky red clay with gleyed ped faces. Both of the subsoil clay horizons are virtually stoneless, have prismatic structures and are assessed as slowly permeable. The soil is non-calcareous and is classified as Wetness Class IV. In a few places weathering sandstone is encountered below 70 cm.

2.7 The second soil type occurs in the south-west and to a limited extent in the north-east of the site. The topsoil, to 25 / 30 cm, is typically a dark brown or dark reddish brown, very slightly stony, medium clay loam. It overlies a reddish brown or dusky red, very slightly stony, sandy clay loam or medium clay loam upper subsoil. At depths between 45 / 70 cm weathering sandstone is encountered, comprising abundant rock in a loamy sand matrix. In only a very few profiles does the sandstone occur deeper than 70 cm. The soil is predominantly non-calcareous, well drained and is classified as Wetness Class I.

2.8 The third soil type occurs in the north-west of the site. The soil is similar to that described in paragraph 2.7 above, except that the profile depth above weathered sandstone is greater. The topsoil to about 30 cm is a dark reddish brown, very slightly stony, medium clay loam. Typically, this overlies a reddish brown or yellowish red sandy clay loam upper subsoil. Below depths ranging mostly from 60 - 90 cm is a lower subsoil of reddish brown loamy medium sand containing many sandstone fragments. Fissured sandstone frequently occurs at the base of the profile. The soil is predominantly non-calcareous, well drained and is classified as Wetness Class I.

2.9 The fourth soil type is found only in the north of the site. Typically, the topsoil comprises 30 cm of dark reddish brown, moderately stony, medium sandy loam. It rests upon dusky red medium sandy loam or loamy sand containing many weathering sandstone fragments. Calcareous fissured sandstone is encountered at about 45 cm. The soil is well drained and is classified as Wetness Class I.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The land has been classified using the guidelines contained in the Agricultural Land Classification of England and Wales (MAFF, 1988). A breakdown of the grades found on the site is given in Table 2 and a description of each grade is given in Appendix 1. At this site the factors which primarily determine grading are soil droughtiness (a function of soil depth, texture, structure and stoniness relative to the crop adjusted moisture deficits in the area) and soil wetness (a function of climate and soil permeability).

Grade 2

3.2 The land having the deeper loamy soils over weathered sandstone (para. 2.8) is mapped as Grade 2. Moisture balance calculations show that the available

water capacity within the soil profiles is slightly limiting for the requirements of certain crops. Because the depth to the sandstone is variable some more droughty profiles, - Subgrade 3a, may occur locally, but these cannot be delineated at the scale of survey.

Table 2. Agricultural Land Classification

Grade	ha	%
2	12.2	30
3a	10.6	26
3b	16.2	40
Other land	1.6	4
TOTAL	40.6	100.0

Subgrade 3a

3.3 The land having the shallower loamy soils over weathered sandstone (para. 2.7) is mapped as Subgrade 3a. Moisture balance calculations show that the available water capacity within the soil profiles is limiting for the requirements of certain deeper rooting crops and in general the land has a moderate droughtiness limitation. However, the depth to weathered sandstone is variable over short distances so profiles with a greater droughtiness limitation, Subgrade 3b, do occur, but these cannot be accurately delineated at the scale of survey. Likewise, less droughty profiles, Grade 2, may also occur locally.

Subgrade 3b

3.4 Land with the clayey soils (para. 2.6) is mapped as Subgrade 3b on account of a moderately severe wetness and workability restriction. The soils have medium or heavy clay loam topsoils and have been assessed as Wetness Class IV. The land will lie wet for long periods and soil management will require careful control to avoid serious structural damage.

3.5 The land having the stony soils overlying sandstone at 45 cm (para. 2.9) is also classified as Subgrade 3b. The presence of rock within the profile inhibits rooting and limits the water available to plants. Moisture balance calculations show that the available water capacity within the soil is limiting for the requirements of most crops and the land has a moderately severe droughtiness limitation.

Other land

3.6 Non-agricultural land within the site consists of New Farm buildings and the dismantled railway track and its margins.

March 1996

Resource Planning Team
ADAS Cambridge

REFERENCES

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

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.

AGRICULTURAL LAND CLASSIFICATION; M1, JUNCTION 26, NOTTINGHAM; SITE 6

1.0 BACKGROUND

1.1 The site covers an area of 17.6 hectares and is one of a series of sites close to the M1 motorway being examined in connection with the Nottingham Local Plan.

1.2 The site is bounded to the south and west by woodland and to the north and east by agricultural land.

1.3 ADAS Statutory Resource Planning Team undertook a reconnaissance Agricultural Land Classification (ALC) survey of the site during February 1996. Information was collected from 7 auger borings at a survey intensity of about 2.5 ha, to a depth of 120 cm or shallower if an impenetrable layer was encountered. Subsoil conditions were inferred using the information gained from three inspection pits located at nearby Sites 7 and 8 (ADAS, 1996), shown to have similar soil types to Site 6.

1.4 On the published provisional 1:63 360 scale ALC map, Sheet 112 (MAFF, 1970) the whole site is mapped as Grade 3. However, this map is of a reconnaissance nature and since its publication the ALC system has been revised (MAFF, 1988). The current survey was undertaken, therefore, to provide more site specific details.

1.5 There are two small areas of woodland in the south-west and south-east of the site. At the time of the survey the remainder of the site was under grass.

2.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

2.1 Climate criteria are considered when classifying land as these may have an overriding limitation in terms of the agricultural use of the land. The main parameters used in the assessment of the overall climate limitation are average annual rainfall (as a measure of overall wetness) and accumulated temperature (day °C Jan-June, as a measure of the relative warmth of an area).

2.2 A detailed assessment of the prevailing climate for the site has been made by interpolation from the 5 km grid dataset produced by the Meteorological Office (Met. Office, 1989). The details are given in Table 1 and show that there is no overall climatic limitation affecting this site.

Table 1 : Climatic Interpolation

Grid Reference	SK 523 463
Altitude (m, AOD)	80
Accumulated Temperature Day °C, Jan-June	1360
Average Annual Rainfall (mm)	687
Moisture Deficit, Wheat (mm)	99
Moisture Deficit, Potatoes (mm)	89
Field Capacity Days	154
Overall Climatic Grade	1

Altitude and Relief

2.3 The land slopes gently from 84 m AOD in the north-west of the site to 74 m AOD in the south-east corner. Slopes nowhere exceed 2° and are not limiting in ALC terms.

Geology and Soils

2.4 The 1:50 000 scale geology map (Geological Survey, 1972) shows the whole site to be underlain by Permo-Triassic Lower Magnesian Limestone.

2.5 There is no published detailed soils information for the site. The reconnaissance soil survey map for the area (Soil Survey, 1983) shows all the site to comprise soils of the Aberford association, these being shallow, locally brashy, well-drained calcareous fine loamy soils over Permian, Jurassic and Eocene limestone.

2.6 The current survey of the site shows the presence of a single soil type. Typically, the topsoil, to 25 cm, is a brown or dark brown, very slightly stony, medium clay loam. Occasionally it may overlie a thin brown sandy clay loam horizon but more usually the topsoil rests directly upon strong brown medium sand containing many weathering sandstone fragments. Calcareous fissured sandstone is encountered at depths of 35 / 55 cm. The soil is well drained and is classified as Wetness Class I.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The land has been classified using the guidelines contained in the Agricultural Land Classification of England and Wales (MAFF, 1988). A breakdown of the grades found on the site is given in Table 2 and a description of each grade is given in Appendix 1. At this site the factor which primarily determines grading is the soil droughtiness, which is a function of soil depth, texture, structure and stoniness relative to the crop adjusted moisture deficits in the area.

Subgrade 3b

3.2 All the agricultural land at the site is classified as Subgrade 3b. Sandstone invariably occurs at shallow depth and the principal effects of this are to inhibit rooting and to limit the water available to plants. Moisture balance calculations show that the available water capacity within the soil profiles is limiting for the requirements of certain crops and in general the land has a moderately severe droughtiness limitation. However, soil depth above the sandstone can vary over short distances so profiles with a greater droughtiness limitation, Grade 4, do occur, but these cannot be accurately delineated at the scale of survey. Likewise, a few less droughty profiles, Subgrade 3a, may also occur locally.

Table 2. Agricultural Land Classification

Grade	ha	%
3b	15.4	88
Other land	2.2	12
TOTAL	17.6	100.0

Other land

3.3 Non-agricultural land within the site consists of the woodland areas in the south-west and south-east.

March 1996

Resource Planning Team
ADAS Cambridge

REFERENCES

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

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.

AGRICULTURAL LAND CLASSIFICATION; M1, JUNCTION 26, NOTTINGHAM; SITE 7

1.0 BACKGROUND

1.1 The site covers an area of 110.3 hectares and is one of a series of sites close to the M1 motorway being examined in connection with the Nottingham Local Plan.

1.2 The site is bounded to the east by the M1 motorway, to the west and south by buildings and gardens associated with the towns of New Nuthall and Watnall and to the north by agricultural land across the B 6009 road. The site contains significant non-agricultural land, notably a fuel dump in the south-west corner, two dismantled railway tracks, buildings associated with Common Farm and Redfield House, access tracks and two small areas of woodland.

1.3 ADAS Statutory Resource Planning Team undertook a reconnaissance Agricultural Land Classification (ALC) survey of the site during February 1996. Information was collected from 39 auger borings at a survey intensity of about 2.8 ha, to a depth of 120 cm or shallower if an impenetrable layer was encountered. Subsoil conditions were assessed from two inspection pits on-site and from using the information gained from one pit located at adjacent Site 4 (ADAS, 1996), shown to have similar soil types to Site 7.

1.4 On the published provisional 1:63 360 scale ALC map, Sheet 112 (MAFF, 1970) all the site is mapped as Grade 2. However, this map is of a reconnaissance nature and since its publication the ALC system has been revised (MAFF, 1988). The current survey was undertaken, therefore, to provide more site specific details.

1.5 At the time of the survey all the agricultural land was in arable production, either winter cereals or cultivated awaiting spring planting.

2.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

2.1 Climate criteria are considered when classifying land as these may have an overriding limitation in terms of the agricultural use of the land. The main parameters used in the assessment of the overall climate limitation are average annual rainfall (as a measure of overall wetness) and accumulated temperature (day °C Jan-June, as a measure of the relative warmth of an area).

2.2 A detailed assessment of the prevailing climate for the site has been made by interpolation from the 5 km grid dataset produced by the Meteorological Office (Met. Office, 1989). The details are given in Table 1 and show that there is no overall climatic limitation affecting this site.

Table 1 : Climatic Interpolation

Grid Reference	SK 508 457
Altitude (m, AOD)	110
Accumulated Temperature Day °C, Jan-June	1327
Average Annual Rainfall (mm)	691
Moisture Deficit, Wheat (mm)	96
Moisture Deficit, Potatoes (mm)	85
Field Capacity Days	157
Overall Climatic Grade	1

Altitude and Relief

2.3 The land forms part of a gently undulating plateau which slopes very gradually south-eastwards from 125 m AOD in the north-west corner of the site to 95 m AOD in the south-east corner. Slopes nowhere exceed 2° and are not limiting in ALC terms.

Geology and Soils

2.4 The 1:50 000 scale geology map (Geological Survey, 1972) shows all of the site to be underlain by Permo-Triassic Lower Magnesian Limestone.

2.5 There is no published detailed soils information for the site. The reconnaissance soil survey map for the area (Soil Survey, 1983) shows all the site to comprise soils of the Aberford association, these being shallow, locally brashy, well-drained calcareous fine loamy soils over Permian, Jurassic and Eocene limestone.

2.6 The current survey of the site shows the presence of three main soil types. Covering most of the northern half of the site is a deep loamy soil overlying weathered sandstone. Most commonly, the topsoil to about 30 cm is a brown or dark reddish brown, very slightly stony, medium clay loam. Typically, this overlies a reddish brown or yellowish red, very slightly stony, medium clay loam, sandy clay loam or medium sandy loam upper subsoil. Below depths ranging mostly from 60 - 90 cm is a lower subsoil of yellowish red loamy medium sand containing many or abundant sandstone fragments. Fissured sandstone invariably occurs at some depth below 75 / 90 cm. The soil is predominantly non-calcareous, well drained and is classified as Wetness Class I.

2.7 The second soil type occurs in the southern half of the site, excluding the south-east corner, and also in a small area to the north of Common Farm. The soil is similar in colours and textures to the profile described above but is differentiated because the weathered sandstone lower subsoil is encountered at depths between 35 and 60 cm. As above, the soil is predominantly non-calcareous, well drained and is classified as Wetness Class I.

2.8 The third soil type occurs in the south-east corner of the site. Characteristically, a dark reddish brown medium clay loam topsoil to 30 cm

overlies a dusky red clay with gleyed ped faces. This clay has prismatic structures and is assessed as slowly permeable. Below 55 / 65 cm the clay rests upon dark red loamy medium sand containing weathered sandstone fragments. Fissured sandstone is encountered below 80 / 85 cm. The soil is non-calcareous and is classified as Wetness Class IV.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The land has been classified using the guidelines contained in the Agricultural Land Classification of England and Wales (MAFF, 1988). A breakdown of the grades found on the site is given in Table 2 and a description of each grade is given in Appendix 1. At this site the factors which primarily determine grading are soil droughtiness (a function of soil depth, texture, structure and stoniness relative to the crop adjusted moisture deficits in the area) and soil wetness (a function of climate and soil permeability).

Table 2. Agricultural Land Classification

Grade	ha	%
2	57.2	52
3a	33.8	31
3b	2.9	2
Other land	16.4	15
TOTAL	110.3	100.0

Grade 2

3.2 The land having the deeper loamy soils over weathered sandstone (para. 2.6) is mapped as Grade 2. Moisture balance calculations show that the available water capacity within the soil profiles is slightly limiting for the requirements of certain deeper rooting crops. Because the depth to the sandstone is variable

some more droughty profiles, - Subgrade 3a, may occur locally, but these cannot be delineated at the scale of survey.

Subgrade 3a

3.3 The land having the shallower loamy soils over weathered sandstone (para. 2.7) is mapped as Subgrade 3a. Moisture balance calculations show that the available water capacity within the soil profiles is limiting for the requirements of certain deeper rooting crops and in general the land has a moderate droughtiness limitation. However, soil depth above the sandstone is variable over short distances so profiles with a greater droughtiness limitation, Subgrade 3b, do occur, but these cannot be accurately delineated at the scale of survey. Likewise, a few less droughty profiles, Grade 2, may also occur locally.

Subgrade 3b

3.4 Land with the clay soils (para. 2.8) is mapped as Subgrade 3b on account of a moderately severe wetness and workability restriction. The soils have medium clay loam topsoils and have been assessed as Wetness Class IV. The land will lie wet for long periods and soil management will require careful control to avoid serious structural damage.

Other land

3.5 The non-agricultural land consists of the fuel dump in the south-west corner, the two dismantled railway tracks and their margins, the buildings and access tracks associated with Common Farm and Redfield House, and two small areas of woodland.

March 1996

Resource Planning Team
ADAS Cambridge

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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 (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.

AGRICULTURAL LAND CLASSIFICATION; M1, JUNCTION 26, NOTTINGHAM; SITE 8

1.0 BACKGROUND

1.1 The site covers an area of 40.6 hectares and is one of a series of sites close to the M1 motorway being examined in connection with the Nottingham Local Plan.

1.2 The site is bounded to the west by the M1 motorway, to the north by the B 6009 road, to the north-east by an airstrip and Bulwell Wood and to the south-east by agricultural land.

1.3 ADAS Statutory Resource Planning Team undertook a reconnaissance Agricultural Land Classification (ALC) survey of the site during February 1996. Information was collected from 13 auger borings at a survey intensity of about 3.1 ha, to a depth of 120 cm or shallower if an impenetrable layer was encountered. Subsoil conditions were assessed from two inspection pits on-site and from using the information gained from two pits located at adjacent Site 7 (ADAS, 1996), shown to have similar soil types to Site 8.

1.4 On the published provisional 1:63 360 scale ALC map, Sheet 112 (MAFF, 1970) all of the site is mapped as Grade 2. However, this map is of a reconnaissance nature and since its publication the ALC system has been revised (MAFF, 1988). The current survey was undertaken, therefore, to provide more site specific details.

1.5 At the time of the survey all the land was in agricultural use, either growing winter cereals or cultivated awaiting spring planting.

2.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

2.1 Climate criteria are considered when classifying land as these may have an overriding limitation in terms of the agricultural use of the land. The main parameters used in the assessment of the overall climate limitation are average annual rainfall (as a measure of overall wetness) and accumulated temperature (day °C Jan-June, as a measure of the relative warmth of an area).

2.2 A detailed assessment of the prevailing climate for the site has been made by interpolation from the 5 km grid dataset produced by the Meteorological Office (Met. Office, 1989). The details are given in Table 1 and show that there is no overall climatic limitation affecting this site.

Table 1 : Climatic Interpolation

Grid Reference	SK 514 466
Altitude (m, AOD)	100
Accumulated Temperature Day °C, Jan-June	1338
Average Annual Rainfall (mm)	695
Moisture Deficit, Wheat (mm)	97
Moisture Deficit, Potatoes (mm)	85
Field Capacity Days	157
Overall Climatic Grade	1

Altitude and Relief

2.3 The land is part of a gently undulating plateau that slopes gradually eastwards from 111 m AOD in the west to 94 m AOD in the east. Slopes nowhere exceed 2° and are not limiting in ALC terms.

Geology and Soils

2.4 The 1:50 000 scale geology map (Geological Survey, 1972) shows the whole site to be underlain by Permo-Triassic Lower Magnesian Limestone.

2.5 There is no published detailed soils information for the site. The reconnaissance soil survey map for the area (Soil Survey, 1983) shows all the site to comprise soils of the Aberford association, these being shallow, locally brashy, well-drained calcareous fine loamy soils over Permian, Jurassic and Eocene limestone.

2.6 The current survey of the site shows the presence of three main soil types. In the north-east and east of the site occurs a shallow, stony soil overlying calcareous fissured sandstone. Typically, the topsoil, to 25 / 30 cm, is a dark reddish brown, slightly stony, sandy clay loam. This overlies a yellowish red or yellowish brown loamy medium sand containing abundant weathering sandstone fragments. Fissured sandstone is encountered at 45 / 50 cm. The soil is well drained and is classified as Wetness Class I.

2.7 The second soil type is widespread in the centre of the site. The topsoil, to about 30 cm, is typically a dark reddish brown, very slightly stony, sandy clay loam. It overlies a dusky red, very slightly stony, sandy clay loam or medium sandy loam upper subsoil extending to 50 / 70 cm. Occasional profiles have a sandy clay upper subsoil. The lower subsoil is a dark red loamy medium sand or medium sand containing many weathered sandstone fragments. Calcareous fissured sandstone is usually encountered at a depth of 70 / 90 cm. The soil is predominantly non-calcareous, well drained and is classified as Wetness Class I.

2.8 The third soil type occurs in the west of the site. The soil has similar colours and textures to the profile described above but differs in that the loamy medium sand lower subsoil is only encountered below 70 cm and the

underlying sandstone is below 90 cm or not reached. The soil is predominantly non-calcareous, well drained and is classified as Wetness Class I.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The land has been classified using the guidelines contained in the Agricultural Land Classification of England and Wales (MAFF, 1988). A breakdown of the grades found on the site is given in Table 2 and a description of each grade is given in Appendix 1. At this site the factor which primarily determines grading is the soil droughtiness, which is a function of soil depth, texture, structure and stoniness relative to the crop adjusted moisture deficits in the area.

Table 2. Agricultural Land Classification

Grade	ha	%
2	11.5	28
3a	19.8	49
3b	9.3	23
TOTAL	40.6	100.0

Grade 2

3.2 The land having the deeper loamy soils (para. 2.8) is mapped as Grade 2. Moisture balance calculations show that the available water capacity within the soil profiles is slightly limiting for the requirements of certain deeper rooting crops. Because the depth to the sandstone is variable some more droughty profiles, - Subgrade 3a, may occur locally, but these cannot be delineated at the scale of survey.

Subgrade 3a

3.3 The land having the shallower loamy soils over sandstone (para. 2.7) is mapped as Subgrade 3a. Moisture balance calculations show that the available water capacity within the soil profiles is limiting for the requirements of certain crops and in general the land has a moderate droughtiness limitation. However, the depth to sandstone is variable over short distances and because of this some profiles with a greater droughtiness limitation, Subgrade 3b, do occur, but these cannot be accurately delineated at the scale of survey. Likewise, less droughty profiles, Grade 2, may also occur locally.

Subgrade 3b

3.4 The land having the stony soils overlying sandstone at 45 / 50 cm (para. 2.6) is classified as Subgrade 3b. The presence of rock within the profile inhibits rooting and limits the water available to plants. Moisture balance calculations show that the available water capacity within the soil is limiting for the requirements of certain crops and the land has a moderately severe droughtiness limitation.

March 1996

Resource Planning Team
ADAS Cambridge

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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 (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.

AGRICULTURAL LAND CLASSIFICATION; M1, JUNCTION 26, NOTTINGHAM; SITE 9

1.0 BACKGROUND

1.1 The site covers an area of 93.7 hectares and is one of a series of sites close to the M1 motorway being examined in connection with the Nottingham Local Plan.

1.2 The site is bounded to the east by the M1 motorway, to the north by the A 610 road, to the north-west by housing of Swingate village and to the south-west by agricultural land. The site contains significant areas of non-agricultural land, notably the buildings and access associated with Windmill Farm and several blocks of woodland, namely Knowle Wood, Verge Wood and Windmill Plantation.

1.3 ADAS Statutory Resource Planning Team undertook a reconnaissance Agricultural Land Classification (ALC) survey of the site during February 1996. Information was collected from 36 auger borings at a survey intensity of about 2.6 ha, to a depth of 120 cm or shallower if an impenetrable layer was encountered. Subsoil conditions were assessed from two inspection pits on-site and from using the information gained from three pits located at nearby Sites 4 and 7 (ADAS, 1996), shown to have similar soil types to Site 9.

1.4 On the published provisional 1:63 360 scale ALC map, Sheet 112 (MAFF, 1970) most of the site is mapped as Grade 2. A small area of Grade 3 land is shown in the south of the site and a small area of woodland in the north is shown as Non-agricultural land. However, this map is of a reconnaissance nature and since its publication the ALC system has been revised (MAFF, 1988). The current survey was undertaken, therefore, to provide more site specific details. Land adjacent to Site 9, immediately east of the M1

motorway, was surveyed in detail by ADAS (1995) and shown to have a range of Grade 2 and Subgrades 3a and 3b agricultural land.

1.5 At the time of the survey all the agricultural land was in arable production, either winter cereals or cultivated awaiting spring planting.

2.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

2.1 Climate criteria are considered when classifying land as these may have an overriding limitation in terms of the agricultural use of the land. The main parameters used in the assessment of the overall climate limitation are average annual rainfall (as a measure of overall wetness) and accumulated temperature (day °C Jan-June, as a measure of the relative warmth of an area).

2.2 A detailed assessment of the prevailing climate for the site has been made by interpolation from the 5 km grid dataset produced by the Meteorological Office (Met. Office, 1989). The details are given in Table 1 and these show that there is a slight climatic limitation affecting the site, restricting land quality to Grade 2 at best. Also, climatic factors interact with soil properties to influence soil wetness and droughtiness.

Table 1 : Climatic Interpolation

Grid Reference	SK 506 435
Altitude (m, AOD)	125
Accumulated Temperature Day °C, Jan-June	1310
Average Annual Rainfall (mm)	698
Moisture Deficit, Wheat (mm)	94
Moisture Deficit, Potatoes (mm)	82
Field Capacity Days	155
Overall Climatic Grade	2

Altitude and Relief

2.3 A gently undulating ridge at 125 - 135 m AOD runs north to south through the west of the site. A hillock to the east of Windmill Farm protrudes to 140 m AOD. From the ridge, the land slopes south-westwards and north-eastwards; the lowest point is 97 m AOD in the north-eastern corner of the site. The only part of the site where slopes exceed 7° is in the north, near Knowle Wood. Slopes here are in the range of 7° - 11° and these gradients impose some limitations on the agricultural quality of the site. Such land cannot be classified better than Grade 3b on account of an increasing risk to the safe and efficient operation of certain farm machinery.

Geology and Soils

2.4 The 1:50 000 scale geology map (Geological Survey, 1972) shows all of the site to be underlain by lower Permo-Triassic rocks. In the south-west occurs Middle Permian Marl while elsewhere is Lower Magnesian Limestone.

2.5 There is no published detailed soils information for the site. The reconnaissance soil survey map for the area (Soil Survey, 1983) shows all the site to comprise soils of the Aberford association, these being shallow, locally brashy, well-drained calcareous fine loamy soils over Permian, Jurassic and Eocene limestone.

2.6 The current survey of the site shows the presence of three main soil types. In the north-west and in the north-east corner of the site occurs a deep loamy soil overlying weathered sandstone. Most commonly, the topsoil to about 30 cm is a dark reddish brown, very slightly stony, medium clay loam. Typically, this overlies a reddish brown, strong brown or yellowish red, very slightly stony, medium or heavy clay loam upper subsoil. Below depths ranging mostly from 45 - 60 cm is a lower subsoil of similarly coloured loamy medium sand containing common sandstone fragments. Weathered rubbly or fissured

sandstone invariably occurs at some depth below 60 / 90 cm. The soil is predominantly non-calcareous, well drained and is classified as Wetness Class I.

2.7 The second soil type occurs in the eastern half of the site and along the western margins. It also occurs atop the knoll near Windmill Farm. The soil is similar to the profile described above except that the loamy sand subsoil is encountered at 35 / 45 cm and the weathered sandstone occurs at 50 / 60 cm. As above, the soil is predominantly non-calcareous, well drained and is classified as Wetness Class I.

2.8 The third soil type occurs in the south-west of the site. Characteristically, a dark reddish brown medium clay loam topsoil to 30 cm overlies a dark red or red heavy clay loam or clay with gleyed ped faces. These clay loam and clay horizons have prismatic structures and are assessed as slowly permeable. Below 55 / 65 cm the clay may rest upon loamy medium sand containing weathered sandstone fragments. The soil is non-calcareous and is classified as Wetness Class IV.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The land has been classified using the guidelines contained in the Agricultural Land Classification of England and Wales (MAFF, 1988). A breakdown of the grades found on the site is given in Table 2 and a description of each grade is given in Appendix 1. At this site the factors which primarily determine grading are soil droughtiness (a function of soil depth, texture, structure and stoniness relative to the crop adjusted moisture deficits in the area) and soil wetness (a function of climate and soil permeability).

Grade 2

3.2 The land having the deeper loamy soils over weathered sandstone (para. 2.6) is mapped as Grade 2. Moisture balance calculations show that the available water capacity within the soil profiles is slightly limiting for the requirements of certain crops. Because the depth to the sandstone is variable some more droughty profiles, - Subgrade 3a, may occur locally, but these cannot be delineated at the scale of survey.

Table 2. Agricultural Land Classification

Grade	ha	%
2	13.4	14
3a	54.3	58
3b	18.5	20
Other land	7.5	8
TOTAL	93.7	100.0

Subgrade 3a

3.3 The land having the shallower loamy soils over weathered sandstone (para. 2.7) is mapped as Subgrade 3a. Moisture balance calculations show that the available water capacity within the soil profiles is limiting for the requirements of certain crops and in general the land has a moderate droughtiness limitation. However, soil depth above the sandstone is variable over short distances so profiles with a greater droughtiness limitation, Subgrade 3b, do occur, but these cannot be accurately delineated at the scale of survey. Likewise, a few less droughty profiles, Grade 2, may also occur locally.

Subgrade 3b

3.4 Land with the clay soils (para. 2.8) is mapped as Subgrade 3b on account of a moderately severe wetness and workability restriction. These soils have medium clay loam topsoils and are assessed as Wetness Class IV. The land will lie wet for long periods and soil management will require careful control to avoid serious structural damage.

3.5 In the north of the site where slopes exceed 7° the land is mapped as Subgrade 3b because these gradients imposes a significant limitation to the safe and efficient use of certain agricultural machinery.

Other land

3.6 The non-agricultural land consists of the buildings and access associated with Windmill Farm. It includes also several blocks of woodland, namely Knowle Wood, Verge Wood and Windmill Plantation.

March 1996

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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 (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.