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Agricultural Land Classification

ASHFORD LOCAL PLAN

Site 7 – Hinxhill

Ministry of Agriculture Fisheries and Food

AGRICULTURAL LAND CLASSIFICATION

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SITE 7 - HINXHILL

1. BACKGROUND

1.1 The 78.82 ha site lies to the east of Ashford and to the north of the M20 motorway at Sevington in Kent. The area is bounded to the north by Hinxhill Road, to the west by Lacton Green and to the south by the A20 (Hythe Road). To the east the area is bounded partially by Bockham Lane and partially by field boundaries and Knuckle Hill Wood.

1.2 The area was surveyed in May 1990 using 110 cm and 120 cm Dutch soil augers, with samples being taken at approximately 100 m intervals across the site. In addition three soil inspection pits were examined.

Land Use

1.3 At the time of survey most of the area was under winter cereals or maize. The remaining fields between Hinxhill Road and Breeches Wood were under permanent pasture, whilst those towards the centre had been recently ploughed. An area under field peas, on the corner of Bockham Lane and Hythe Road, was also present.

2. PHYSICAL FACTORS AFFECTING LAND QUALITY

Relief

2.1 The altitude of the site varies between approximately 50 m A.O.D. and 70 m A.O.D. with the highest land occurring towards the north of Knuckle Hill Wood. The land falls gently in all directions towards the centre of the site which is relatively low-lying and flat.

Across most of the site gradient is not significant in terms of a limitation to land quality or land use. However, at the far north of the site adjacent to Knuckle Hill Wood, slopes of 9° were recorded, these acting as a limitation to agricultural land quality.

Climate

2.2 Estimates of climatic variables were obtained by interpolation from a 5 km grid database (Met Office, 1989) for a representative location in the survey area.

Climatic Interpolation

Grid Ref	TQ 60461417
Altitude (m A.O.D.)	50-70
Accumulated temperature (° days, Jan-June)	1427-1450
Annual average rainfall (mm)	759-772
Field capacity days	158-160
Moisture deficit, wheat (mm)	113-116
Moisture deficit, potatoes (mm)	108-111

2.3 The important parameters in assessing an overall climatic limitation are, average annual rainfall (a measure of overall wetness) and accumulated temperature, (a measure of the relative warmth of a locality). Although average annual rainfall is relatively low and accumulated temperature relatively high, in a national context, there is no overall climatic limitation affecting the land quality of this site. However, climatic factors do affect interactive limitations between soil and climate, namely soil wetness and droughtiness.

Geology and Soils

2.4 British Geological Survey, Sheet 289, Canterbury (1982) shows much of the area to be underlain by Folkestone Beds with Hythe Beds outcropping across the south-eastern part of the site. Towards the

centre and along the areas dissected by drains recent alluvium deposits occur. Sandgate Beds are shown as occurring across the south-western part of the site, and in the vicinity of The Warren, river terrace gravels have been mapped.

2.5 Soil Survey of England and Wales, Sheet TR04 (Ashford) shows a range of soil associations across the site. Those which are most extensive include the Fladbury Series (described as 'non-calcareous groundwater gley soils' (SSEW 1973)), which is found in association with the alluvial deposits on the site and the Ditton Series, (described as 'gleyed brown earths' (SSEW, 1973)). Less commonly occurring are the Barming Series (well drained brown earths), the Roseacre Series (described as 'gleyed brown earths' (SSEW, 1973)) and the Mersham Series (these being described as, 'brown calcareous soils' (SSEW, 1973)).

2.6 Detailed field examination of the soils indicates that there are broadly four types which were identified.

2.7 One of the most extensive soil groups observed is that which occurs in association with the alluvial deposits on the site, ie, through the central low-lying part of the site and along the main drainage ditches.

Profiles typically comprise stoneless, non-calcareous medium or heavy clay loam or medium or heavy silty clay loam topsoils. These either pass directly into medium clay or silty clay, or occasionally through heavy clay loam or heavy silty clay loam in the upper subsoil to medium clay or silty clay in the lower subsoil. All profiles are imperfectly drained, as evidenced by prominent mottling and gleying throughout the subsoil, (ie, below about 25-35 cm), as a result of the subsoil being slowly permeable. Soils are assigned to wetness class IV.

2.8 The second group of soils are associated with Folkestone Bed deposits on the site and are found across the north-western part of the site approximately between Breeches Wood, Knuckle Hill Wood and Hinxhill Road.

Profiles typically comprise non-calcareous fine sandy loam or fine sandy silt loam, topsoils which are occasionally very slightly stony, (eg. containing between 1 and 5% v/v small flints). These topsoils overlie similar textures or sandy clay loam, loamy medium sand, or occasionally medium sand at depths below 75 cm. Occasional profiles become mottled and gleyed in the subsoil from about 25-50 cm, but all are freely draining and are therefore assigned to wetness class I. Typically profiles are non-calcareous in the subsoil and only occasionally very slightly stony (ie, 2-5% v/v small flints).

2.9 The third group of soils occur principally towards the south-western part of the site, although they do occur elsewhere. Profiles are similar to those described in section 2.8 although heavier in texture.

Profiles typically comprise fine sandy clay loam, sandy silt loam or medium clay loam topsoils which are non-calcareous to very slightly calcareous and commonly contain between 1% and 8% v/v small flints.

These overlie similar textures in the subsoil generally passing to heavier textures, such as (heavy) sandy clay loams, sandy clay or medium clays at variable depths between 30 and 85 cm. Profiles may be slightly stony throughout as the topsoil. Frequently profiles are mottled and gleyed at depths greater than 30 cm, although some profiles are not gleyed throughout. Such variation in drainage status results in these soils being assigned to wetness class I, II or III.

2.10 The remaining soils on the site are generally medium textured and have two varients.

- The first varient comprises those soils which have medium textures, although profiles tend to become heavier with depth. Profiles typically comprise medium clay loam topsoils, which overlie subsoils of similar texture to depths of about 100 cm, or pass to heavy clay loams and medium clay below about 40-50 cm. Those profiles which have heavier textures in the subsoil

tend to have slight drainage imperfections as evidenced by gleying at variable depths below about 40 cm. Soils in this group are assigned to wetness class I - III. Occasional profiles become impenetrable (to soil auger), due to the presence of hard sandy limestone (Hythe Beds) at depths greater than 50 cm.

- The second varient comprises those soils which have medium textures, but become more sandy with depth and occasionally become impenetrable, (to soil auger) over sandy limestone, (Hythe Beds). Profiles are similar to those described above, but they pass to sandy clay loam or sandy loam textures at about 75-100 cm. Although these soils are generally well drained, occasional profiles are gleyed at variable depths, thus indicating impeded drainage, and a wetness class of I to III is assigned accordingly. The presence of sandy limestone at depths below 50 cm in occasional profiles results in them being impenetrable to soil auger.

3. AGRICULTURAL LAND CLASSIFICATION

3.1 The ALC grading of this site is primarily determined by interactions between soil and climatic factors namely wetness and droughtiness. Occasionally other factors, specifically topsoil stoniness and gradient, impose a limitation on the agricultural land quality at this locality.
ALC grades 1, 2, 3a and 3b have been mapped on the site, and a breakdown of the grades in terms of area and extent is given below.

	Area (ha)	% of total agricultural land
Grade 1	2.67	4.3%
2	22.01	35.0%
3a	14.10	22.4%
3b	24.04	38.3%
Total agricultural area	62.82	
Non Ag.	7.80	
Woodland	8.20	
Total area of site	78.82	

3.2 Appendix 1 gives a generalised description of the grades and sub-grades identified in this survey.

3.3 Grade 1

Land of this quality represents a small percentage (4.3%) of the total agricultural land on the site and occurs as one mapping unit towards the south-east.

Profiles typically comprise very slightly calcareous to non-calcareous medium clay loam topsoils which have <5% v/v of flints >2 cm, overlying similar textures in the upper subsoil and heavy clay loam, sandy clay loam or medium clay in the lower subsoil. Occasional profiles become impenetrable (to soil auger), over sandy limestone (Hythe Beds) below about 90 cm. These soils are well drained being only occasionally slightly gleyed from about 70 cm and are thereby assigned to wetness class I.

This land has no or very minor limitations to agricultural use and is capable of supporting a wide range of crops including horticulture.

3.4 Grade 2

Land of this quality occupies about 35% of the total agricultural land present, occurring as a number of mapping units across the site.

Profiles tend to be variable but typically comprise fine sandy silt loam or sandy silt loam topsoils, with occasional medium clay loam or sandy clay loam textures. Topsoils may be very slightly stony having 1-3% v/v of small flints >2 cm, and are generally non-calcareous.

Subsoil textures are variable with the upper subsoils having similar textures to the topsoils, whilst the lower subsoil textures range from those which become more sandy with depth, ie, typically passing to sandy loam, loamy sand or sandy clay horizons, to those which become slightly heavier with depth such as heavy clay loam or medium clay. Generally those subsoils which have sandy textures possess a slight droughtiness limitation, whereas those whose subsoils are heavier suffer from slight drainage imperfections as evidenced by mottling and gleying from depths between 25 and 50 cm. Wetness classes I to III are assigned to these profiles according to drainage status as assessed by depth to gleying and/or slowly permeable horizons. Land in this grade has only minor limitations to agricultural use which may affect crop yield, cultivations or harvesting.

3.5 Grade 3a

Grade 3a land represents about 22% of the total agricultural land on the site.

Profiles typically comprise medium clay loam, fine sandy clay loam, or very occasionally silt loam topsoils which are generally non-calcareous to very slightly calcareous. Between 1% and 12% v/v small and medium flints >2 cm may be present in the topsoil. Textures in the upper subsoil are similar to those in the topsoil, generally becoming heavier with depth, ie, heavy clay loam or (heavy) sandy clay loam, and passing to medium clay or fine sandy clay between 45 and 50 cm.

These soils are limited by wetness problems; slowly permeable clay horizons at 45-50 cm impede drainage through the profile and cause mottling and gleying from 30 cm. Profiles are thus assigned to wetness class III.

Occasional profiles may be more freely draining (wetness class II), but are limited by topsoil stone contents of 10% - 12% v/v of small and medium flints >2 cm.
Overall, these soils have wetness and workability restrictions and are capable of supporting moderate yields from a range of crops such as cereals and the less demanding horticultural crops.

3.6 Grade 3b

Grade 3b land is found across 38% of the agricultural land on the site and it occurs in two situations.
Across the majority of the site, land of this quality is associated with the alluvial deposits. Profiles typically comprise medium/heavy clay loam, or medium/heavy silty clay loam topsoils, these being non-calcareous and stonefree. These overlie similar textures in the upper subsoil and pass to gleyed and slowly permeable clay or silty clay within 40 cm. These soils are limited in their agricultural use by poor drainage, they are assigned to wetness class IV accordingly.
An area at the far north of the site has been mapped as grade 3b due to gradient. Profiles at this locality typically comprise sandy silt loam or sandy loam topsoils overlying similar textures or sandy clay loam in the subsoil. The soils may be gleyed at depths greater than 70 cm, thus indicating they are moderately well drained, (wetness class I or II). Slight stoniness (ie, 8-10% v/v of medium flints >2 cm), throughout places a minor limitation on their agricultural use in terms of slight droughtiness and cultivations restrictions. However, gradient is the most significant limitation to this land, with slopes of up to 9° being recorded.

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SOURCES OF REFERENCE

BRITISH GEOLOGICAL SURVEY (1982) Sheet 289, Canterbury.

MAFF (1988) Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land.

METEOROLOGICAL OFFICE (1989) Climatological datasets for Agricultural Land Classification.

SOIL SURVEY OF ENGLAND AND WALES (1973) Sheet TR04, Ashford.

APPENDIX 1

DESCRIPTION OF THE GRADES AND SUBGRADES

The ALC grades and subgrades are described below in terms of the types of limitation which can occur, typical cropping range and the expected level and consistency of yield. In practice, the grades are defined by reference to physical characteristics and the grading guidance and cut-offs for limitation factors in Section 3 enable land to be ranked in accordance with these general descriptions. The most productive and flexible land falls into Grades 1 and 2 and Subgrade 3a and collectively comprises about one-third of the agricultural land in England and Wales. About half the land is of moderate quality in Subgrade 3b or poor quality in Grade 4. Although less significant on a national scale such land can be locally valuable to agriculture and the rural economy where poorer farmland predominates. The remainder is very poor quality land in Grade 5, which mostly occurs in the uplands.

Descriptions are also given of other land categories which may be used on ALC maps.

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 includes 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 root 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 level of yields. It is mainly suited to grass with occasional arable crops (eg cereals and forage crops) the yields of which are variable. In moist 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.

Descriptions of other land categories used on ALC maps

Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture including: housing, industry, commerce, education, transport, religious buildings, cemeteries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

Non-agricultural

'Soft' uses where most of the land could be returned relatively easily to agriculture, including: golf courses, private parkland, public open spaces, sports fields, allotments and soft-surfaced areas on airports/airfields. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

Woodland

Includes commercial and non-commercial woodland. A distinction may be made as necessary between farm and non-farm woodland.

Agricultural buildings

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (eg polythene tunnels erected for lambing) may be ignored.

Open water

Includes lakes, ponds and rivers as map scale permits.

Land not surveyed

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above land cover types, eg buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will usually be shown.

FIELD ASSESSMENT OF SOIL WETNESS CLASS

SOIL WETNESS CLASSIFICATION

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six revised soil wetness classes (Hodgson, in preparation) are identified and are defined in Table 11.

Table 11 Definition of Soil Wetness Classes

Wetness Class	Duration of Waterlogging[1]
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years[2].
II	The soil profile is wet within 70 cm depth for 31-90 days in most years *or*, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 90 days, but not wet within 40 cm depth for more than 30 days in most years.
III	The soil profile is wet within 70 cm depth for 91-180 days in most years *or*, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 180 days,but only wet within 40 cm depth for between 31 and 90 days in most years.
IV	The soil profile is wet within 70 cm depth for more than 180 days but not within 40 cm depth for more than 210 days in most years *or*, if there is no slowly permeable layer within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.
V	The soil profile is wet within 40 cm depth for 211-335 days in most years.
VI	The soil profile is wet within 40 cm depth for more than 335 days in most years.

[1] The number of days specified is not necessarily a continuous period.

[2] 'In most years' is defined as more than 10 out of 20 years.

Soils can be allocated to a wetness class on the basis of quantitative data recorded over a period of many years or by the interpretation of soil profile characteristics, site and climatic factors. Adequate quantitative data will rarely be available for ALC surveys and therefore the interpretative method of field assessment is used to identify soil wetness class in the field. The method adopted here is common to ADAS and the SSLRC.