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AGRICULTURAL LAND CLASSIFICATION

Tonbridge and Malling
Local Plan

Ministry of
Agriculture
Fisheries
and Food

AGRICULTURAL LAND CLASSIFICATION

TONBRIDGE LOCAL PLAN

1 BACKGROUND

1 1 The 45 6 hectare site lies to the northeast of Tonbridge in Kent It is bounded to the north by Cuckoo Lane to the east by the A26 and to the south by housing The western boundary is marked by hedgerow

1 2 The site was surveyed on the 18th 20th and 26th February 1991 using Dutch soil augers with a sampling density of 1 per 100 m intervals across the site on a grid basis In addition two soil pits were examined

Land Use

1 3 At the time of survey most of the site was under winter cereals A small area to the north west was under oilseed rape with the remainder under apple orchards

2 PHYSICAL FACTORS AFFECTING LAND QUALITY

2 1 Relief

The site varies in altitude from 35-46 m A O D falling gently towards the east and southeast Nowhere on the site does gradient or altitude represent a significant limitation to agricultural land quality

2 2 Climate

The average annual rainfall for this area is around 692 mm (Met Office 1989) The median accumulated temperature above 0°C between January and June a measure of the relative warmth of the locality is expected to be 1473 day degrees which is relatively high in a national context (Met Office 1989) The site has a

field capacity day period of 144 days (Met Office 1989) which provides a measure on the effect of climate on the soil water regime and indicates the relative dryness of this locality Crop adjusted moisture deficits are 117 mm for wheat and 112 mm for potatoes The site is unlikely to be frost prone or exposed

2 3 Climatic factors per se place no limitation on agricultural land quality but do affect interactive limitation between soil and climate namely soil wetness and droughtiness

Geology and Soils

2 4 British Geological Survey Sheet 287 (Sevenoaks 1971) shows most of the site to be underlain by Weald Clay with a small area towards the eastern part of the site comprising Brickearth deposits

2 5 Soil Survey of England and Wales Sheet TQ64 Paddock Wood (1986) shows most of the site to comprise soils of the Hook Series They are described as Deep permeable, stoneless, slightly mottled silty soils that are well drained' (SSEW 1984) Towards the south western half of the site the soils are comprised of Park Gate Series these being described as Deep stoneless silty soils with occasional clayey subsoils which are prominently mottled and seasonally waterlogged (SSEW 1984)

2 6 Detailed field examination indicates that there are three soil groups present across the site

2 7 Firstly and most extensively are those soils which rest over slowly permeable clay They can be divided into two varients

Non calcareous silt loams to medium silty clay loams overlying similar or slightly heavier textures in the upper subsoil resting over clay between 70-85 cm Gleying and evidence of wetness frequently occurs in or immediately above the clay indicative of its slow permeability These soils are assigned to wetness class I and II

The second varient is similar to that described above but has slightly poorer drainage conditions due to the occurrence of a slowly permeable horizon between about 30-70 cm
The occurrence of these soils is most noticeable towards the north and north west of the site Profiles typically comprise silt loams to medium silty clay loam topsoils overlying medium/heavy silty clay loams over silty clay These soils were found to be mottled and gleyed between 27 and 50 cm and are thus assigned to wetness class II III or IV
Occasional profiles were found to have a slightly stony topsoil containing c 3-10% v/v of small sandstone and flint fragments with occasional small sandstone fragments in the lower subsoil i e c 5-30% in a sandy clay loam matrix

2 8 The second main soil type are those which rest over sandstone Profiles typically comprise silt loams medium silty clay loams to medium clay loam topsoils overlying medium/heavy silty clay loams with c 3-15% v/v sandstone in the upper subsoil Textures become heavier with depth and stone content increases to about 50% eventually becoming impenetrable (to a soil auger) due to hard sandstone between 45-100 cm
Evidence of gleying was found to occur between 28-48 cm and soils are appropriately assigned to wetness class III and IV

In addition to this soils comprising similar textures were found but there was a noticeable absence of gleying
Profiles typically comprise silt loams, medium silty clay loams to medium clay loam topsoils with c 4-7% small sandstones overlying similar textures in the subsoil with occasional profiles comprising fine sandy clay loams with c 5% sandstone within this horizon These pass to medium/heavy clay loam or sandy clay loam with c 30-50% v/v sandstone in the lower subsoil where upon the profile becomes impenetrable (to soil auger) between 45-100 cm due to hard brashy sandstone These soils are assigned to wetness class I

2 9 The third main soil group are those which were found to be deep stoneless and well drained wetness class I Profiles typically comprise silt loam to medium silty clay loam topsoils overlying similar textures or medium clay loam in the upper subsoil and passing to heavy silty clay loam over silty clay or medium clay in the lower subsoil

3 AGRICULTURAL LAND CLASSIFICATION

3 1 The ALC grading of the survey area is primarily determined by interactions between climate and soil factors namely wetness and droughtiness ALC grades 1, 2 3a and 3b have been mapped and the breakdown of these grades in terms of area and extent is given below

Grades	Area	% of total agricultural area
1	4 23	10
2	11 72	29
3a	22 92	56
3b	2 05	5
Non Agricultural	3 48	
Not Surveyed	1 2	
Total Agricultural Area	40 92	
Total Area	45 6	

3 2 Grade 1

Land of this quality represents 10% (4 23 ha) of the total agricultural land and occurs towards the south of the site Grade 1 land is typically well drained (wetness class I) and comprises silt loam to medium silty clay loam topsoils overlying similar textures of medium clay loam becoming heavier with depth typically passing to clay between about 80-100 cm

Occasional profiles comprise sandy clay in the lower subsoil and were found to be impenetrable (to soil auger) at about 100 cm due to hard sandstone Although occasional profiles were found to be gleyed and impenetrable at depth wetness and droughtiness do not impose a limitation upon these soils No other factors restrict the agricultural potential of this land

3 3 Grade 2

Land of this quality represent 29- (11 72 ha) of the total agricultural land and occurs in a large unit across the central and southern part of the site

Grade 2 land occurs in two situations Firstly profiles typically comprise silt loam or medium silty clay loam topsoils overlying medium or heavy silty clay loam in the upper subsoil Soils become heavier with depth passing to medium clay or silty clay between 55 and 80 cm These soils are mottled and gleyed between c 45-55 cm this being indicative of impeded drainage and are thus assigned to wetness class II Consequently wetness and workability restrictions impose a limitation upon these soils

The second group of soils within this grade typically comprise silt loam or medium clay loam topsoils with c 2-10- v/v small angular and round sandstone overlying similar textures or medium clay loams becoming progressively heavier with depth Stone content varies from c 10-40% v/v in the upper subsoil passing to medium silty clay and medium clay with occasional sandy clay textures in the lower subsoil, overlying an impenetrable horizon (to soil auger) between 85-100 cm due to hard brashy sandstone Occasional profiles were gleyed and thus assigned to wetness class I or II however droughtiness acts as the overriding limitation to the quality of this land due to stoniness and relatively shallow soil depth

3 4 Grade 3a

Land of this quality represent 56- (22 92 ha) of the total agricultural land on the site

Grade 3a land occurs in two situations Those profiles situated on the upper slopes towards the north and west comprise silt loam or medium silty clay loam topsoils overlying medium/heavy silty clay loams or medium clay loams which are gleyed between 27 and 45 cm These rest over medium silty clay or medium clay which are typically slowly permeable between 30 and 60 cm of the surface They are thus assigned to wetness class II and III with wetness and workability restrictions acting as a limitation to the land quality

The remainder of grade 3a land occurs on the lower slopes towards the north east of the site and is limited by soil droughtiness Profiles typically comprise silt loam, medium silty clay loam or medium clay loam topsoils which are stony with c 1-7% v/v small angular to rounded sandstone These overlie similar textures or heavy silty clay loam in the upper subsoil with c 1-4% v/v sandstone passing to heavier textures at depth Occasional profiles comprise fine sandy clay loams in the lower subsoil The stone content tends to increase with depth typically between c 15-80% v/v of small/medium sized fragments of hard weathered sandstone in a clay matrix in the lower subsoil overlying an impenetrable horizon (to soil auger) at c 45-90 cm due to hard sandstone

Occasional profiles were gleyed between 32 and 40 cm resting over slowly permeable clay with in 60 cm of the surface These soils are thus assigned to wetness class II and III

As a result of slight stoniness and shallow profiles over brashy sandstone soil droughtiness acts as a limitation to the potential of the land in this grade

3 5 Grade 3b

Land of this quality occupies approximately 5% (2 05 ha) of the total agricultural land and occurs in a small strip towards the far north western corner of the site Profiles typically comprise medium silty clay loam topsoils overlying medium/heavy silty clay in the upper subsoil These pass to slowly permeable silty clay within 30 cm of the surface Profiles are strongly mottled and

gleyed from about 30-48 cm which combined with the slowly permeable nature of the clay causes these soils to be assigned to wetness class IV Thus soil wetness and workability form the most limiting factors to the agricultural use of this land

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SOURCES OF REFERENCE

BRITISH GEOLOGICAL SURVEY (1971) Sheet 287 Sevenoaks

MAFF (1988) Agricultural Land Classification of England and Wales Revised Guidelines and Criteria for Grading the Quality of Agricultural Land

METEOROLOGICAL OFFICE (1989) Climatological Data Sets for Agricultural Land Classification

SOIL SURVEY OF ENGLAND AND WALES (1986) Sheet TQ64 Paddock Wood

SOIL SURVEY OF ENGLAND AND WALES (1984) Soils and their Use in South East England Bulletin 15

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

APPENDIX

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