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AGRICULTURAL LAND CLASSIFICATION

PROPOSED A228 (B2015) HALE STREET BY-PASS NORTHERN OBJECTOR S ROUTE 3

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Resource Planning Team
ADAS Statutory Group
Reading

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1 Summary

1 1 During April 1993 a detailed Agricultural Land Classification (ALC) survey was carried out on 15 5 hectares of land along the line of the proposed northern objector s route of the A228 (B2015) Hale Street By-pass Kent The work was undertaken on behalf of MAFF who were commissioned by Kent County Council Highways and Transportation Department to determine the quality of agricultural land affected by the proposal

This ALC survey represents a supplement to earlier work carried out by ADAS for Kent County Council during August and November 1992 for the proposed Hale Street By-pass

1 2 The results of the survey are presented in the form of a coloured plan illustrating the distribution of ALC grades along the line of the proposed northern objector s route The map has been drawn at a scale of 1 10 000 It is accurate at this scale but any enlargement may be misleading

1 3 Within the survey corridor , the areas and extent of the ALC grades are as follows

Distribution of Grades and Sub-grades

	Area (ha)	% total agricultural area
Grade 2	2 0	24 7
3a	1 0	12 3
3b	4 5	55 6
4	0 6	7 4
Total Agricultural area	8 1	100
Woodland	5 8	
Urban	1 0	
Not surveyed	0 6	
Total area surveyed	15 5 ha	

1 4 Appendix 1 gives a description of the grades and land-use categories identified in this survey

1 5 The main factors influencing the ALC grading within the survey area are the result of the interaction of soil and climatic factors giving rise to soil wetness and/or droughtiness limitations to agricultural land quality

2 Background

2 1 The Agricultural Land Classification system provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long term limitations on agricultural use The limitations can operate in one or more of four principal ways they may affect the range of crops which can be grown, the level of yield the consistency of yield and the cost of obtaining it The classification system gives considerable weight to flexibility of cropping whether actual or potential, but the ability of some land to produce consistently high yields of a somewhat narrower range of crops is also taken into account

2 2 The principal physical factors influencing agricultural production are climate, site and soil These factors together with interactions between them form the basis for classifying land into one of five grades Grade 1 land being of excellent quality and Grade 5 land of very poor quality Grade 3 which constitutes about half of the agricultural land in England and Wales, is now divided into two subgrades designated 3a and 3b General descriptions of the grades and subgrades are given in Appendix 1

2 3 Further details of the Agricultural Land Classification System are contained in the MAFF publication "Agricultural Land Classification of England and Wales - Revised guidelines and criteria for grading the quality of agricultural land (MAFF 1988)

2 4 In connection with the detailed ALC survey work on the northern objector s route at Hale Street a corridor of land, approximately 50 m wide, was surveyed with the line of the proposed road route lying at the centre of the corridor 19 soil auger borings were described in accordance with MAFF s revised guidelines and criteria for grading the quality of agricultural land (MAFF, 1988) Data from the earlier ALC work undertaken in August and November 1992 was used to assist in the assessment and delineation of the ALC grades

3 Physical Factors Affecting Land Quality

Climate

3 1 Climatic criteria are considered first when classifying land since climate can be overriding in the sense that severe limitations will restrict land quality irrespective of favourable site and soil conditions

Climatic data relevant to the assessment of agricultural land quality were obtained by interpolation from a 5 km gridpoint dataset (Met Office, 1989) for representative locations in the survey area

Climatic Interpolation

Grid Reference	TQ 677 494	TQ 666 511	TQ 664 514
Altitude (m AOD)	10	30	50
Average Annual Rainfall (mm)	660	668	678
Accumulated Temperature (° days, Jan-June)	1500	1477	1454
Field Capacity Days	137	139	140
Moisture Deficit, wheat (mm)	123	119	117
Moisture Deficit, potatoes (mm)	121	115	112

3 2 The important parameters used in the assessment of an overall climatic limitation are average annual rainfall as a measure of overall wetness and accumulated temperature, as a measure of the relative warmth of a locality

The climatic interpolation above indicates that there is no overall climatic limitation affecting the ALC grading of the survey area

3 3 Climatic factors will however interact with soil factors to influence soil wetness and droughtiness limitations The area around Hale Street has relatively low average annual rainfall and associated with this high moisture deficits This increases the risk and degree of droughtiness on soils which lack good reserves of available water Conversely, the relatively dry climate (137-140 field capacity days) reduces the likelihood of soil wetness problems and increases the opportunity for land work in favourable conditions

Relief

3 4 Land within the survey area lies at an altitude of about 10-50 m A O D , the lowest land occurring at the southern end of the proposed objector s route and rising gently towards the north-west to a maximum of 50 m where the proposed route intersects the existing A228 (formerly the B2016) east of Mount Pleasant Farm At the northernmost end of the proposed route the land falls into a small valley and then continues to rise north-westwards

At no point along the survey 'corridor' does altitude or gradient represent a limitation to agricultural land quality

Geology and Soils

3 5 The published geological map covering the Hale Street area (British Geological Survey Sheet 287 1971) indicates that the proposed northern objector s route passes through areas of alluvium and brickearth south of the B2015 and Borough s Oak Farm North of here the proposed route overlies deposits of Weald Clay, in the vicinity of Beech Wood and Seven Mile Lane

3 6 A semi-detailed soil map at a scale of 1 25,000 has been published for the Paddock Wood area (Sheet TQ 64, SSEW, 1986) This covers the south-eastern part of the northern objector's route and shows the soils as being the Hamble series associated with brickearth and Fladbury series developed in clayey river alluvium The northern part of the objector s route has not been mapped in detail by the Soil Survey but is shown to comprise the loamy over clayey or clayey Wickham 1 association on the reconnaissance (1 250 000 scale) soil map of South East England (SSEW, 1983)

3 7 Detailed examination of the soils along the line of the proposed objector s route generally confirms the presence of soils similar to those described above Profiles typically comprise medium or heavy clay loam or silty clay loam topsoils which overlie subsoils of similar texture which generally become more clayey with depth

thereby reducing soil permeability Soils are imperfectly to poorly drained depending on depth to slowly permeable clay in the subsoil giving rise to the range of ALC grades mapped The more poorly drained soils are associated with the deposits of alluvium and Weald clay whilst soils developed in brickearth tend to be better drained

4 Agricultural Land Classification

4 1 Land quality within the survey area ranges from grade 2 to 4 Land of a higher quality (grade 2 and 3a) is graded thus because of droughtiness and/or wetness limitations whilst 3b is mainly associated with heavy slowly permeable soils affected by soil wetness and workability Grade 4 land has been mapped in connection with a very wet, semi-permanently waterlogged area at the far southern end of the proposed route
In addition areas of woodland and urban land, (existing roads) have been mapped

Grade 2

4 2 Land of this quality has been mapped in association with brickearth deposits around the B2015 east of Borough s Oak Farm The soils observed comprise stoneless non-calcareous medium clay loam topsoils over similarly textured upper subsoils which pass to heavy clay loam and clay below about 45-50 cm Occasional profiles become more sandy and moderately stony in the lower subsoil Gleying is evident in the lower subsoils as a result of slowly permeable clay horizons and imperfect drainage Profiles are assigned to wetness I or II The relatively dry climatic regime in this area gives rise to these profiles being prone to a slight risk of drought The land is therefore graded 2 on the basis of slight soil wetness and/or droughtiness limitations Such land is versatile and capable of supporting a wide range of arable and horticultural crops

Grade 3a

4 3 A small area of land at the northernmost end of the proposed northern objector s route has been assigned to sub-grade 3a on the basis of soil wetness Profiles comprise stone free non-calcareous medium clay loam topsoils overlying heavy clay loam and clay in the subsoil Evidence of wetness in the form of gleying is observed at varying depths below the topsoil whilst slowly permeable clay or silty clay horizons were encountered between 45 and 50 cm Given these drainage

characteristics wetness class III is appropriate and land is graded 3a accordingly Such land is flexible in use and capable of producing moderate yields of a wide range of arable and the less demanding horticultural crops, although land may have workability limitations due to an increased risk of wetness

Grade 3b

4 4 Much of the land along the northern objector s route has been assigned to moderate quality grade 3b land It is associated with heavy, poorly drained, clayey soils derived from either alluvium or Weald clay

South of the B2015, land graded 3b comprises non-calcareous heavy silty clay loam topsoils resting on gleyed and slowly permeable clay, either immediately below the topsoil or within 40 cm These poorly drained alluvial soils are assigned to wetness class IV and suffer serious wetness and workability limitations which will affect the flexibility of cultivations, cropping and grazing

North of Beech Wood grade 3b land is associated with Weald clay deposits Profiles are similar to those described above but tend to be more silty Again wetness class IV is appropriate the land being limited by wetness and workability problems

Grade 4

4 5 A small unit of poor quality grade 4 land has been mapped at the southernmost end of the northern objector s route This represents an area of very poorly drained soils which are significantly wetter than those described above This land is likely to have severe restrictions to its agricultural use in terms of wetness and workability

SOURCES OF REFERENCE

- **BRITISH GEOLOGICAL SURVEY** (1971) Sheet 287 Sevenoaks (Solid and drift)

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

- **METEOROLOGICAL OFFICE** (1989) Climatic datasets for Agricultural Land Classification

- **SOIL SURVEY OF ENGLAND AND WALES** (1983) Sheet 6, Soils of South-East England

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

- **SOIL SURVEY OF ENGLAND AND WALES** (1986) Soil Survey Record 99 Soils in Kent IV Sheet TQ 64 Paddock Wood

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 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