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Swale Borough Local Plan (Iwade)
Site 10: East Iwade
Agricultural Land Classification
ALC Map & Report
September 1993

**SWALE BOROUGH LOCAL PLAN (IWADE)
SITE 10 : EAST IWADE
AGRICULTURAL LAND CLASSIFICATION REPORT**

1.0 Summary

- 1.1 In June 1993, a detailed Agricultural Land Classification (ALC) Survey was made on approximately 2.5 hectares of land to the east of Iwade in Kent.
- 1.2 The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group of ADAS in response to a commission by MAFF's Land Use Planning Unit to provide information on the quality of agricultural land under consideration for inclusion in the Swale Borough Local Plan.
- 1.3 The classification has been made using MAFF's revised guidelines and criteria for grading the quality of agricultural land (MAFF, 1988). These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on its use for agriculture.
- 1.4 The fieldwork was carried out with an observation density of approximately one per hectare. A total of 4 borings and one soil pit were examined.
- 1.5 The table below provides the details of the grades found across the site. The majority of the land is classified as good quality. The key limitation is soil wetness.

Table 1 : Distribution of Grades and Subgrades

<u>Grade</u>	<u>Area (ha)</u>	<u>% of Site</u>
3a	1.9	73.9
Urban	<u>0.7</u>	<u>26.1</u>
Total Area of Site	2.6 ha	100 %

- 1.6 The distribution of the ALC grades is shown on the attached map. The information is presented at a scale of 1:5,000; it is accurate at this level but any enlargement would be misleading. This map supercedes any previous ALC information for this site.
- 1.7 At the time of survey the site was mostly an old orchard, which was overgrown with weeds. However a significant amount of the surveyed area is currently under urban use, as a service station, a hauliers yard and housing.
- 1.8 A general description of the grades and subgrades is provided as an appendix. The main classes are described in terms of the type of limitation that can occur, the typical cropping range and the expected level and consistency of yield.

2.0 Climate

- 2.1 The climatic criteria are considered first when classifying land as climate can be overriding in the sense that severe limitations will restrict land to low grades irrespective of favourable site or soil conditions.
- 2.2 The main parameters used in the assessment of the overall climatic limitation are annual average rainfall, as a measure of overall wetness, and accumulated temperature, as a measure of the relative warmth of a locality.
- 2.3 A detailed assessment of the prevailing climate was made by interpolation from a 5km gridpoint dataset (Met. Office, 1989). The details are given in the table below and these show that there is no overall climatic limitation affecting the site.
- 2.4 No local climatic factors such as exposure or frost risk affect the site.

Table 2 : Climatic Interpolations

Grid Reference	TQ902676
Altitude (m)	10
Accumulated Temperature (days)	1487
Average Annual Rainfall (mm)	573
Field Capacity (days)	111
Moisture Deficit, Wheat (mm)	126
Moisture Deficit, Potatoes (mm)	125
Overall Climatic Grade	1

3.0 Relief

- 3.1 The site is approximately 10m AOD, and is flat overall.

4.0 Geology and Soil

- 4.1 The relevant published geological sheet (British Geological Survey, Sheet 272, Chatham) shows the survey area to be underlain with Recent Period Head Brickearth, mostly derived from a loamy parent rock such as the Thanet Beds or the Sandgate Beds.
- 4.2 From the Soil Survey of England and Wales, Bulletin 9, Soils of Kent (1980, 1:250,000) the area is shown to be underlain by soils of the Park Gate/Hook series described as, "silty soils in brickearth, slightly or moderately affected by ground water. Soils were generally found to have a more clayey nature than that described.

5.0 Agricultural Land Classification

- 5.1 Table 1 provides the details of the area measurements for each grade and the distribution of each grade is shown on the attached ALC map.

5.2 The location of the soil observation points is shown on the attached sample point map.

5.3 Subgrade 3a

The agricultural area of this site has been designated good quality. It was found to be limited by soil wetness. This was evidenced by a slowly permeable (from pit observation) clay horizon beneath a gleyed heavy clay loam upper subsoil and a medium clay loam topsoil. All horizons were found to contain small amounts of stones (up to 5% total flints by volume). The depth at which the clay was encountered was such that, in the local climatic regime, wetness class III was appropriate and the land can be graded no higher than Subgrade 3a.

The wetness limitation adversely affects plant growth by affecting seed germination and survival, partly by reducing soil temperature and partly because of anaerobism. It also inhibits the development of a good root system and can, in extreme cases, lead to plant death. Soil wetness also influences the sensitivity of the soil to structural damage and as such is a major factor in determining the number of days when the soil is in suitable condition for cultivation, trafficking by machinery or grazing by livestock.

5.4 The areas marked as urban include domestic dwellings and associated buildings, a service station and commercial hauliers yard.

ADAS Reference: 2011/094/93

MAFF Reference: EL 20/245

Resource Planning Team
Guildford Statutory Centre
ADAS Reading

SOURCES OF REFERENCE

- * British Geological Survey (1977), Sheet No 272, Chatham. 1:50000.
- * 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 for Agricultural Land Classification.
- * Soil Survey of England and Wales (1976), Record No 37, Soils in Kent III, Sheet TQ86 (Rainham), 1:25000.
- * Soil Survey of England and Wales (1980), Bulletin No.15, Soils of Kent, 1:250000.

APPENDIX I

DESCRIPTION OF THE GRADES AND SUB-GRADES

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 or horticultural crops can usually be grown but on some land on 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. When 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.

Sub-grade 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 the 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.

Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture : 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.

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, eg. buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will be shown.

APPENDIX II

DEFINITION OF SOIL WETNESS CLASSES

Wetness Class I

The soil profile is not wet within 70cm depth for more than 30 days in most years.

Wetness Class II

The soil profile is wet within 70cm depth for 31-90 days in most years or, if there is no slowly permeable layer within 80cm depth, it is wet within 70cm for more than 90 days, but not wet within 40cm depth for more than 30 days in most years.

Wetness Class III

The soil profile is wet within 70cm depth for 91-180 days in most years or, if there is no slowly permeable layer within 80cm depth, it is wet within 70cm for more than 180 days, but only wet within 40cm depth for 31-90 days in most years.

Wetness Class IV

The soil profile is wet within 70cm depth for more than 180 days but not wet within 40cm depth for more than 210 days in most years or, if there is no slowly permeable layer within 80cm depth, it is wet within 40cm depth for 91-210 days in most years.

Wetness Class V

The soil profile is wet within 40cm depth for 211-335 days in most years.

Wetness Class VI

The soil profile is wet within 40cm depth for more than 335 days in most years.

(The number of days is not necessarily a continuous period. 'In most years' is defined as more than 10 out of 20 years.)

APPENDIX III

SOIL PIT AND SOIL BORING DESCRIPTIONS

- Contents :**
- * Soil Abbreviations : Explanatory Note
 - * Soil Pit Descriptions
 - * Database Printout : Boring Level Information
 - * Database Printout : Horizon Level Information

SOIL PROFILE DESCRIPTIONS : EXPLANATORY NOTE

Soil pit and auger boring information collected during ALC fieldwork is held on a database. This has commonly used notations and abbreviations as set out below.

Boring Header Information

1. GRID REF : national grid square and 8 figure grid reference.

2. USE : Land use at the time of survey. The following abbreviations are used.

ARA : Arable WHT : Wheat BAR : Barley CER : Cereals OAT : Oats MZE : Maize OSR : Oilseed rape
BEN : Field Beans BRA : Brassicae POT : Potatoes SBT : Sugar Beet FCD : Fodder Crops LIN : Linseed
FRT : Soft and Top Fruit HRT : Horticultural Crops PGR : Permanent Pasture LEY : Ley Grass RGR : Rough Grazing
SCR : Scrub CFW : Coniferous Woodland DCW : Deciduous Woodland HTH : Heathland BOG : Bog or Marsh
FLW : Fallow PLO : Ploughed SAS : Set aside OTH : Other

3. GRDNT : Gradient as measured by a hand-held optical clinometer.

4. GLEY/SPL : Depth in cm to gleying or slowly permeable layers.

5. AP (WHEAT/POTS) : Crop-adjusted available water capacity.

6. MB (WHEAT/POTS) : Moisture Balance.

7. DRT : Best grade according to soil droughtiness.

8. If any of the following factors are considered significant, an entry of 'Y' will be entered in the relevant column.

MREL : Microrelief limitation FLOOD : Flood risk EROSN : Soil erosion risk EXP : Exposure limitation FROST : Frost
DIST : Disturbed land CHEM : Chemical limitation

9. LIMIT : The main limitation to land quality. The following abbreviations are used.

OC : Overall Climate AE : Aspect EX : Exposure FR : Frost Risk GR : Gradient MR : Microrelief
FL : Flood Risk TX : Topsoil Texture DP : Soil Depth CH : Chemical WE : Wetness WK : Workability
DR : Drought ER : Soil Erosion Risk WD : Combined Soil Wetness/Droughtiness ST : Topsoil Stoniness

Soil Pits and Auger Borings

1. TEXTURE : soil texture classes are denoted by the following abbreviations.

S : Sand LS : Loamy Sand SL : Sandy Loam SZL : Sandy Silt Loam CL : Clay Loam ZCL : Silty Clay Loam
SCL : Sandy Clay Loam C : Clay SC : Sandy Clay ZC : Silty Clay OL : Organic Loam P : Peat SP : Sandy Peat
LP : Loamy Peat PL : Peaty Loam PS : Peaty Sand MZ : Marine Light Silts

For the sand, loamy sand, sandy loam and sandy silt loam classes, the predominant size of sand fraction will be indicated by the use of prefixes.

F : Fine (more than 66% of the sand less than 0.2mm)

M : Medium (less than 66% fine sand and less than 33% coarse sand)

C : Coarse (more than 33% of the sand larger than 0.6mm)

The clay loam and silty clay loam classes will be sub-divided according to the clay content.

M : Medium (<27% clay) H : Heavy (27-35% clay)

2. **MOTTLE COL** : Mottle colour

3. **MOTTLE ABUN** : Mottle abundance, expressed as a percentage of the matrix or surface described.

F : few <2% C : common 2-20% M : many 20-40 VM : very many 40% +

4. **MOTTLE CONT** : Mottle contrast

F : faint - indistinct mottles, evident only on close inspection D : distinct - mottles are readily seen

P : prominent - mottling is conspicuous and one of the outstanding features of the horizon

5. **PED. COL** : Ped face colour

6. **STONE LITH** : One of the following is used.

HR : all hard rocks and stones MSST : soft, medium or coarse grained sandstone

SI : soft weathered igneous or metamorphic SLST : soft oolitic or dolimitic limestone

FSST : soft, fine grained sandstone ZR : soft, argillaceous, or silty rocks CH : chalk

GH : gravel with non-porous (hard) stones GS : gravel with porous (soft) stones

Stone contents (> 2cm, > 6cm and total) are given in percentages (by volume).

7. **STRUCT** : the degree of development, size and shape of soil peds are described using the following notation:

- degree of development WK : weakly developed MD : moderately developed ST : strongly developed

- ped size F : fine M : medium C : coarse VC : very coarse

- ped shape S : single grain M : massive GR : granular AB : angular blocky SAB : sub-angular blocky PR : prismatic

PL : platy

8. **CONSIST** : Soil consistence is described using the following notation:

L : loose VF : very friable FR : friable FM : firm VM : very firm EM : extremely firm EH : extremely hard

9. **SUBS STR** : Subsoil structural condition recorded for the purpose of calculating profile droughtiness.

G : good M : moderate P : poor

10. **POR** : Soil porosity. If a soil horizon has less than 0.5% biopores >0.5 mm, a 'Y' will appear in this column.

11. **IMP** : If the profile is impenetrable a 'Y' will appear in this column at the appropriate horizon.

12. **SPL** : Slowly permeable layer. If the soil horizon is slowly permeable a 'Y' will appear in this column.

13. **CALC** : If the soil horizon is calcareous, a 'Y' will appear in this column.

14. Other notations

APW : available water capacity (in mm) adjusted for wheat

APP : available water capacity (in mm) adjusted for potatoes

MBW : moisture balance, wheat

MBP : moisture balance, potatoes

SOIL PIT DESCRIPTION

Site Name : SWALE LP (IWADE) SITE 10 Pit Number : 1P

Grid Reference: TQ90216745 Average Annual Rainfall : 573 mm
 Accumulated Temperature : 1487 degree days
 Field Capacity Level : 111 days
 Land Use :
 Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 17	MCL	10YR31 32	0	1		
17- 47	HCL	10YR51 00	0	0	M	MDCSAB
47- 70	C	25Y 52 00	0	2	M	MDCAB

Wetness Grade : 3A Wetness Class : III
 Gleying : 017 cm
 SPL : 047 cm

Drought Grade : 3B APW : mm MBW : 0 mm
 APP : mm MBP : 0 mm

FINAL ALC GRADE : 3A
 MAIN LIMITATION : Wetness

SAMPLE NO.	GRID REF	ASPECT USE	--WETNESS--		-WHEAT-		-POTS-		M.REL		EROSN	FROST	CHEM	ALC	COMMENTS
			GRDNT	GLEY SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	
1	TQ90156763	ORC	015	050	3	3A		0	0					WE 3A	SPL 50
1P	TQ90216745	ORC	017	047	3	3A		0	0					WE 3A	SPL 47
2	TQ90206753	ORC	015	050	3	3A		0	0					WE 3A	SPL 50
3	TQ90206748	ORC	015	035	3	3A		0	0					WE 3A	SPL 35
4	TQ90206745	ORC	015	055	3	3A		0	0					WE 3A	SPL 55

SAMPLE	DEPTH	TEXTURE	COLOUR	---MOTTLES---			PED	----STONES----			STRUCT/	SUBS	SPL	CALC
				COL	ABUN	CONT	COL.	GLEY	>2	>6	LITH	TOT		
1	0-15	mc1	10YR31 00					0	0	HR	2			
	15-50	hc1	10YR52 51 10YR56 00 M				00M00 00 Y	0	0		0	M		
	50-80	c	25Y 51 00 10YR56 66 M				00M00 00 Y	0	0	HR	5	M		Y
1P	0-17	mc1	10YR31 32					0	0	HR	1			
	17-47	hc1	10YR51 00 10YR56 66 M				00M00 00 Y	0	0		0	MDCSAB FR M	Y	
	47-70	c	25Y 52 00 10YR66 00 M				00M00 00 Y	0	0	HR	2	MDCAB FR M	Y	Y
2	0-15	mc1	10YR31 00					0	0		0			
	15-50	hc1	10YR52 51 10YR56 00 M				Y	0	0		0	M		
	50-90	c	25Y 52 51 10YR56 00 M				Y	0	0	HR	5	M		Y
3	0-15	mc1	10YR31 00					0	0		0			
	15-35	hc1	10YR51 52 10YR56 00 M				Y	0	0		0	M		
	35-90	c	25Y 52 51 10YR56 00 M				00M00 00 Y	0	0	HR	5	M		Y
4	0-15	mc1	10YR32 00					0	0	HR	1			
	15-55	hc1	10YR52 00 10YR56 00 M				00M00 00 Y	0	0		0	M		
	55-70	c	25Y 52 00 10YR56 66 M				00M00 00 Y	0	0		0	M		Y