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**Swale Borough Local Plan (Iwade)**  
**Site 4 : South of School Lane, Iwade**  
**Agricultural Land Classification**  
**ALC Map and Report**  
**June 1993**

**SWALE BOROUGH LOCAL PLAN (IWADE)  
 SITE 4 : SOUTH OF SCHOOL LANE, IWADE  
 AGRICULTURAL LAND CLASSIFICATION REPORT**

**1. Summary**

1.1 In June 1993, a detailed Agricultural Land Classification, (ALC), survey was carried out on 12.7 hectares of land at Iwade in Kent. ADAS was commissioned by MAFF's Land Use Planning Unit to determine the quality of agricultural land under consideration for inclusion in the Swale Borough Local Plan.

1.2 The survey was conducted by members of the Resource Planning Team, Guildford Statutory Group at an observation density of approximately one boring per hectare. A total of 10 borings and one soil inspection pit were described in accordance with 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.

At the time of survey, the agricultural land on the site was in cereal (wheat) production with a small area of grassland towards the south of the site. A small area of woodland and a sports field were also identified.

1.3 The distribution of grades and subgrades is shown on the attached ALC map and the area and extent are given in the table below. The map has been drawn at a scale of 1:5,000. It is accurate at this scale, but any enlargement may be misleading. This map supersedes any previous ALC information for the site.

Table 1 : Distribution of Grades and Subgrades

	<u>Area (ha)</u>	<u>% of agricultural area</u>
<u>Grade 3b</u>	11.05	100
Total agricultural area	<u>11.05</u>	
Non-agricultural	1.43	
Woodland	<u>0.22</u>	
Total area of site	12.70 ha	

1.4 A general description of the grades and land-use categories identified in this survey is provided as an appendix. The grades are described in terms of the type of limitation that can occur, the typical cropping range and the expected level and consistency of yield.

1.5 The site has been graded entirely Subgrade 3b on the basis of significant soil wetness and workability limitations. Despite a relatively dry climatic regime at this locality, heavy, poorly drained soils may adversely affect plant growth and/or impose restrictions on cultivations or grazing.

## 2. Climate

- 2.1 Estimates of climatic variables relevant to the assessment of agricultural land quality were obtained by interpolation from a 5 km grid point dataset (Met Office, 1989) for representative locations in the survey area.

Table 2 : Climatic Interpolations

Grid Reference	TQ898673	TQ894673
Altitude (m, AOD)	15	20
Accumulated Temperature (°days, Jan-June)	1482	1476
Average Annual Rainfall (mm)	586	589
Field Capacity Days	114	115
Moisture deficit, wheat (mm)	124	124
Moisture deficit, potatoes (mm)	122	121

- 2.2 Climatic factors are considered first when classifying land since climate can be overriding in the sense that adverse climatic conditions may restrict land quality irrespective of favourable site and soil conditions. The details in the table above show that there is no overall climatic limitation affecting this site. In addition, no local climatic factors such as exposure or frost risk affect the site.
- 2.3 However, climatic factors do interact with soil factors to influence soil wetness and droughtiness limitations. At this locality, the climate is relatively warm and dry in a regional and national context. Field capacity days are low and crop adjusted moisture deficits are correspondingly high thereby giving rise to an increased risk of soil droughtiness problems.

## 3. Relief

- 3.1 The site lies at an altitude of 15-20 m AOD, falling gently from west to east. Nowhere on the site does gradient or microrelief act as a limitation to agricultural land quality.

## 4. Geology and Soils

- 4.1 British Geological Survey, (1977) Sheet 272, Chatham shows the site to be underlain by two geological deposits. Tertiary London Clay outcrops across the south-western part of the site which is overlain by Recent Head Brickearth deposits across the north-eastern half of the site.
- 4.2 Soil Survey of England and Wales (1976) Sheet TQ86, Soils in Kent III, shows the site to comprise soils of the Windsor and Wickham series, the latter being the most extensive. These are described as, 'imperfectly to poorly drained silty clay loams or silty loams over slowly permeable clay', (SSEW, 1976).
- 4.3 Detailed field examination of the soils on the site broadly confirms the presence of heavy, poorly drained clay soils.

## 5. 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 are shown on the attached sample point map.

### Subgrade 3b

- 5.3 All of the agricultural land surveyed on the site has been assigned to Subgrade 3b, on the basis of soil wetness and workability limitations. Profiles typically comprise non-calcareous, heavy clay loam or occasionally clay topsoils. These may contain up to 5% total flints. Topsoils directly overlie gleyed and slowly permeable clay in the upper subsoil which severely impedes effective soil drainage, thereby causing wet conditions throughout the profile. Soils were thus assigned to Wetness Class III. Despite the relatively warm, dry climate which prevails at this locality, the combination of poor soil drainage status and heavy topsoil textures cause significant soil wetness and workability restrictions. Soil wetness may adversely affect seed germination, crop growth and development, whilst heavy topsoils restrict opportunities for trafficking, cultivations and grazing by livestock.

ADAS Ref: 2011/93/93  
MAFF Ref: EL20/245

Resource Planning Team  
Guildford Statutory Group  
ADAS Reading

## SOURCES OF REFERENCE

- \* British Geological Survey (1977) Sheet 272, Chatham
- \* 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 (1976) Sheet TQ86, Soils in Kent III, and accompanying bulletin.

## APPENDIX I

### 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.

## APPENDIX II

### FIELD ASSESSMENT OF SOIL WETNESS CLASS

#### Definition of Soil Wetness Classes

Wetness Class	Duration of Waterlogging <sup>1</sup>
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years <sup>2</sup> .
II	The soil profile is wet within 70 cm depth for 31-90 days in most years <u>or</u> , 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 <u>or</u> , 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 <u>or</u> , 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.

<sup>1</sup> The number of days specified is not necessarily a continuous period.

<sup>2</sup> 'In most years' is defined as more than 10 out of 20 years.



## APPENDIX III

### SOIL BORING AND SOIL PIT DESCRIPTIONS

#### Contents:

- \* Soil boring descriptions
- \* Soil pit descriptions
- \* Soil Abbreviations : Explanatory Note

## SOIL PROFILE DESCRIPTIONS : EXPLANATORY NOTE

Soil profile and pit information obtained during ALC surveys is held on a database. This has commonly used notations and abbreviations as set out below.

### BORING HEADERS

1. GRID REF : National grid square followed by 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 - sugarbeet

FDC - fodder crops

FRT - soft and top fruit

HOR/HRT - horticultural crops

PAS/PGR - permanent pasture

RGR - rough grazing

LEY - ley grassland

CFW - coniferous woodland

DCW - deciduous woodland

SCR - scrub

HTH - heathland

BOG - bog or marsh

FLW - fallow

PLO - ploughed

SAS - set-aside

OTH - other

LIN - linseed

3. GRDNT : Gradient as measured by optical reading clinometer.

4. GLEY/SPL : Depth in centimetres (cm) to gleyed and/or slowly permeable horizons.

5. AP (WHEAT/POTS) : Crop-adjusted available water capacity. The amount of soil water (in millimetres) held in the soil profile that is available to a growing crop (wheat and potatoes are used as reference crops).

6. MB (WHEAT/POTS) : The moisture balance for wheat and potatoes obtained by subtracting the soil moisture deficit from the crop-adjusted available water capacity.

7. DRT: Grade according to soil droughtiness assessed against soil moisture balances.

8. M REL : Micro-relief )  
FLOOD : Flood risk ) If any of these factors are considered  
EROSN : Soil erosion ) significant in terms of the assessment  
EXP : Exposure ) of agricultural land quality a 'y' will  
FROST : Frost prone ) be entered in the relevant column.  
DIST : Disturbed land )  
CHEM : Chemical limitation)

9. **LIMIT** : Principal limitation to agricultural land quality.  
The following abbreviations are used:

OC - overall climate	CH - chemical limitations
AE - aspect	WE - wetness
EX - exposure	WK - workability
FR - frost	DR - drought
GR - gradient	ER - erosion
MR - micro-relief	WD - combined soil wetness/soil droughtiness
FL - flooding	ST - topsoil stoniness
TX - soil texture	
DP - soil depth	

### PROFILES & PITS

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

S	- sand
LS	- loamy sand
SL	- sandy loam
SZL	- sandy silt loam
ZL	- silt loam
MZCL	- medium silty clay loam
MCL	- medium clay loam
SCL	- sandy clay loam
HZCL	- heavy silty clay loam
HCL	- heavy clay loam
SC	- sandy clay
ZC	- silty clay
C	- clay

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

F	- fine (more than $\frac{2}{3}$ of the sand less than 0.2 mm)
C	- coarse (more than $\frac{1}{3}$ of sand greater than 0.6 mm)
M	- medium (less than $\frac{2}{3}$ fine sand and less than $\frac{1}{3}$ coarse sand)

The sub-divisions of clay loam and silty clay loam classes according to clay content are indicated as follows:

M	- medium (less than 27% clay)
H	- heavy (27-35% clay)



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

- ped shape                      S - single grain  
   M - massive  
   GR - granular  
   SB/SAB - sub-angular blocky  
   AB - 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

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----		PED	----STONES----			STRUCT/	SUBS							
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH	TOT	CONSIST	STR	POR	IMP	SPL	CALC
1	0-29	hc1	10YR42 43					0	0	0								
	29-70	c	10YR63 00 75YR56 00 M			10YR71 00 Y		0	0	0		P		Y				Few Mn concs.
1P	0-29	hc1	10YR42 00 75YR56 58 C					Y	0	0	HR	5						
	29-55	c	10YR52 00 75YR56 58 M					Y	0	0	HR	5	STCOAB FM P	Y		Y		
2	0-29	hc1	10YR43 00						0	0		0						
	29-70	c	10YR53 00 75YR56 00 C			10YR71 00 Y			0	0		0		P		Y		
3	0-30	hc1	10YR43 00						0	0		0						
	30-70	c	10YR62 00 75YR56 58 M			10YR61 00 Y			0	0		0		P		Y		Common Mn concs.
4	0-28	c	10YR41 00						0	0		0						
	28-70	c	10YR52 00 75YR56 58 M			10YR61 00 Y			0	0		0		P		Y		Few Mn concs.
5	0-28	hc1	10YR43 00						0	0		0						
	28-40	c	10YR52 53 75YR56 58 M			10YR61 00 Y			0	0	HR	5		P		Y		Imp 40+ - stones
6	0-30	hc1	10YR42 00 75YR56 00 F						0	0		0						
	30-70	c	10YR53 00 75YR58 00 M			10YR61 00 Y			0	0		0		P		Y		Common Mn concs.
7	0-30	hc1	10YR42 00 75YR56 00 C					Y	0	0		0						
	30-70	c	10YR61 00 75YR56 68 M					Y	0	0		0		P		Y		
8	0-32	hc1	10YR42 00						0	0		0						
	32-70	c	10YR61 00 75YR68 00 M			00M00 00 Y			0	0	HR	2		P		Y		Few Mn concs.
9	0-30	hc1	10YR42 00						0	0		0						
	30-60	c	10YR61 00 75YR56 68 M					Y	0	0		0		P		Y		
10	0-25	c	10YR42 00						0	0		0						
	25-65	c	10YR53 00 75YR58 00 C			10YR71 00 Y			0	0	HR	2		P		Y		

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	LIMIT	
1	TQ89506750	WHT S	1	29	29	3	3B	000	0	000	0			WE	3B		
1P	TQ89706740	PAS S	1	0	29	3	3B	000	0	000	0			WE	3B		
2	TQ89606750	WHT E	1	29	29	3	3B	000	0	000	0			WE	3B		
3	TQ89706750	WHT N	1	30	30	3	3B	000	0	000	0			WE	3B		
4	TQ89506740	WHT N	1	28	28	3	3B	000	0	000	0			WE	3B		
5	TQ89606740	WHT N	1	28	28	3	3B	000	0	000	0			WE	3B	IMP 40	
6	TQ89706740	PAS S	1	30	30	3	3B	000	0	000	0			WE	3B		
7	TQ89806740	PAS S	1	0	30	3	3B	000	0	000	0			WE	3B		
8	TQ89606730	WHT S	1	32	32	3	3B	000	0	000	0			WE	3B		
9	TQ89706730	WHT S	1	30	30	3	3B	000	0	000	0			WE	3B		
10	TQ89406746	WHT S	1	25	25	3	3B	000	0	000	0			WE	3B		

SOIL PIT DESCRIPTION

Site Name : SWALE LP(IWADE)- SITE 4 Pit Number : 1P

Grid Reference: TQ89706740 Average Annual Rainfall : 586 mm  
Accumulated Temperature : 1482 degree days  
Field Capacity Level : 114 days  
Land Use :  
Slope and Aspect : 1 degrees S

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 29	HCL	10YR42 00	0	5	C	
29- 55	C	10YR52 00	0	5	M	STCOAB

Wetness Grade : 3B Wetness Class : III  
Gleying : 0 cm  
SPL : 29 cm

Drought Grade : APW : 000mm MBW : 0 mm  
APP : 000mm MBP : 0 mm

FINAL ALC GRADE : 3B  
MAIN LIMITATION : Wetness