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SWALE BOROUGH LOCAL PLAN
SITE 5, ISLE OF SHEPPEY, KENT
AGRICULTURAL LAND CLASSIFICATION
ALC MAP & REPORT
JULY, 1993

SWALE BOROUGH LOCAL PLAN, SITE 5, ISLE OF SHEPPEY, KENT
AGRICULTURAL LAND CLASSIFICATION REPORT

1.0 Summary

1.1 In July ,1993, a detailed Agricultural Land Classification (ALC) was made on approximately 12 hectares of land south of Harps Avenue on the southern edge of Minster 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 affected by the possible inclusion of this area 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. 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 10 borings and 2 soil pits were examined.

1.5 The table below provides details of the grades found across the site. All of the agricultural land (12.0 ha) is classified as Sub-grade 3B. The key limitation is soil wetness related to heavy topsoils overlying poorly structured clay subsoils which cause significant waterlogging in the soil profile and restrict the workability of the land.

Table 1 : Distribution of Grades and Sub-grades

Grade	Area	% of Site	% of Agricultural Area
3B	12.0	96.8	100
Urban	0.2	1.6	
Agric. Buildings	0.2	1.6	
	12.4	100.0	

1.6 The ALC information is presented on the attached map 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 land on the site had been recently ploughed.

1.8 A general description of the grades and sub-grades 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. 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 :	TQ951274
Altitude (m) :	15
Accumulated Temperature (days) :	1478
Average Annual Rainfall (mm) :	545
Field Capacity (days) :	97
Moisture Deficit, Wheat (mm) :	129
Moisture Deficit, Potatoes (mm) :	128
Overall Climatic Grade :	1

3.0 Relief

3.1 The survey area occupies flat land.

4.0 Geology and Soil

4.1 The relevant geological sheet for the site shows the underlying geology to be London Clay. Heavy soil profiles have developed over this parent material, with heavy clay loam and clay topsoils overlying clay subsoils.

5.0 Agricultural Land Classification

5.1 The ALC information 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 Sub-grade 3B : Pit 2 is typical of the soils that occur on the site. Heavy clay loam topsoils overlie upper and lower clay subsoils. Soil wetness is the main limiting factor related to the presence of shallow gleying and shallow poorly structured clay horizons that are slowly permeable. The profiles are placed in Wetness Class III and, given the prevailing Field Capacity Day value (97 days), can be graded no higher than Sub-grade 3B. This degree of wetness restricts the range of crops that can tolerate such conditions and also reduces the number of days when the soil is in a suitable condition for cultivation, trafficking by machinery or grazing by livestock. Shallow gleying also occured at Pit 1 but the slowly permeable horizon did not start until 65 cm, placing the profile into Wetness Class II and, technically, Sub-grade 3A. Adjacent auger borings suggest that the slowly

permeable layer generally starts at a shallower depth than that indicated in Pit 1 and no separate map unit has been delineated.

5.4 A small area (0.2 ha) is occupied by agricultural buildings and another by urban buildings (0.2 ha).

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.

Sub-grade 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

REFERENCES

* 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.

* British Geological Survey (1978), Sheet No.272, Chatham, 1:50,000

APPENDIX III

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 IV

SOIL PIT AND SOIL BORING DESCRIPTIONS

Contents :

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 appropiate 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 LOCAL PLAN SITE 5 Pit Number : 1P

Grid Reference: TQ94757250 Average Annual Rainfall : 545 mm
Accumulated Temperature : 1478 degree days
Field Capacity Level : 97 days
Land Use : Bare Soil
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2.	TOT.STONE	MOTTLES	STRUCTURE
0- 35	HCL	10YR42 00	0	3	C	
35- 65	C	25Y 53 00	0	0	C	MCSAB
65- 85	C	10YR53 00	0	0	M	MCP

Wetness Grade : 3A Wetness Class : II
Gleying :000 cm
SPL :065 cm

Drought Grade : 3A APW : 111mm MBW : -18 mm
APP : 116mm MBP : -12 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : SWALE LOCAL PLAN SITE 5 Pit Number : 2P

Grid Reference: TQ94857240 Average Annual Rainfall : 545 mm
Accumulated Temperature : 1478 degree days
Field Capacity Level : 97 days
Land Use : Bare Soil
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 25	HCL	10YR42 00	0	4	C	
25- 55	C	25Y 54 00	0	0	M	MCP

Wetness Grade : 3B Wetness Class : III
Gleying :000 cm
SPL :025 cm

Drought Grade : 3B APW : 079mm MBW : -50 mm
APP : 082mm MBP : -46 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Wetness

SAMPLE NO.	GRID REF	ASPECT USE	GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M.REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT		ALC	COMMENTS
1	TQ947 725	PLO		020	035	3	3B	089	-40	095	-33	3B				WE	3B		
1P	TQ94757250	PLO		000	065	2	3A	111	-18	116	-12	3A				WE	3A		
2	TQ94807250	PLO		000	025	3	3B	082	-47	088	-40	3B				WE	3B		CHK GLEY
2P	TQ94857240	PLO		000	025	3	3B	079	-50	082	-46	3B				WE	3B		
3	TQ94907250	PLO		000	025	3	3B	081	-48	087	-41	3B				WE	3B		SPL
4	TQ95007250	PLO		000	030	3	3B	000	0	000	0					WE	3B		SPL
5	TQ94807240	PLO		025	025	3	3B	087	-42	093	-35	3B				WE	3B		
6	TQ94907240	PLO		000	025	3	3B	084	-45	093	-35	3B				WE	3B		
7	TQ95007240	PLO		000	030	3	3B	084	-45	090	-38	3B				WE	3B		
8	TQ95107240	PLO		000	025	3	3B	082	-47	088	-40	3B				WE	3B		SPL
9	TQ95207240	PGR		030	050	3	3B	095	-34	107	-21	3B				WE	3B		
10	TQ95307240	PGR		000	025	3	3B	078	-51	081	-47	4				WE	3B		SPL

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL.	GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC
1	0-20	hzcl	10YR31 00						0	0		0						
	20-35	c	10YR42 00	10YR56 00	M			Y	0	0		0		M				
	35-60	c	25Y 53 00	10YR56 00	M			Y	0	0		0		P	Y		Y	
1P	0-35	hcl	10YR42 00	10YR58 61	C			Y	0	0	HR	3						
	35-65	c	25Y 53 00	10YR58 61	C			Y	0	0		0	MCSAB	FM	M			
	65-85	c	10YR53 00	10YR56 00	M		00MN00 00	Y	0	0		0	MCP	FM	P	Y		Y
2	0-25	c	10YR42 41	10YR56 00	C			Y	0	0	HR	1						
	25-60	c	25Y 53 00	000C00 00	M			Y	0	0		0		P	Y		Y	
2P	0-25	hcl	10YR42 00	000C00 00	C			Y	0	0	HR	4						
	25-55	c	25Y 54 00	10YR56 00	M		10YR53 00	Y	0	0		0	MCP	FM	P	Y		Y
3	0-25	c	10YR42 00	10YR56 00	M			Y	0	0	HR	2						
	25-60	c	10YR53 00	10YR56 00	M		00MN00 00	Y	0	0		0		P	Y		Y	
4	0-30	c	10YR42 00	000C00 00	M			Y	0	0	HR	2						
	30-60	c	10YR52 00	000C00 00	M			Y	0	0		0		P	Y		Y	
5	0-25	hzcl	10YR42 00	10YR58 00	F				0	0		0						
	25-40	c	10YR52 00	10YR58 61	C			Y	0	0		0		P	Y		Y	
	40-60	c	25Y 53 00	10YR58 61	C		00MN00 00	Y	0	0		0		P	Y		Y	
6	0-25	c	10YR52 00	10YR58 61	C			Y	0	0	HR	5						
	25-45	c	10YR53 00	10YR58 61	C			Y	0	0		0		P	Y		Y	
	45-65	c	25Y 63 00	10YR58 61	C		00MN00 00	Y	0	0		0		P	Y		Y	
7	0-30	c	10YR52 00	10YR58 61	C			Y	0	0		0						
	30-40	c	10YR63 00	10YR58 61	C		00MN00 00	Y	0	0		0		P	Y		Y	
	40-60	c	25Y 63 00	10YR58 61	C		00MN00 00	Y	0	0		0		P	Y		Y	
8	0-25	c	25Y 52 00	000C00 00	M			Y	0	0	HR	1						
	25-60	c	25Y 62 00	000C00 00	M			Y	0	0		0		P	Y		Y	
9	0-30	c	10YR42 00	000C00 00	M				0	0	HR	2						
	30-50	c	25Y 52 00	000C00 00	M			Y	0	0	HR	2		M				
	50-70	c	25Y 63 00	000C00 00	M			Y	0	0	HR	1		P	Y		Y	
10	0-25	c	10YR42 00	000C00 00	C			Y	0	0	HR	2						
	25-55	c	25Y 52 00	000C00 00	M			Y	0	0		0		P	Y		Y	