

**AGRICULTURAL LAND
CLASSIFICATION REPORT**

SWALE BOROUGH LOCAL PLAN

**LAND AT TUNSTALL,
SITE GG**

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SWALE BOROUGH LOCAL PLAN LAND AT TUNSTALL, SITTINGBOURNE, SITE GG AGRICULTURAL LAND CLASSIFICATION

Summary

- 1 1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality on land at Tunstall Site GG This work was in connection with Swale Borough Local Plan
- 1 2 Approximately 4.4 hectares of land relating to land at Tunstall, Site GG was surveyed in July 1994 The survey was undertaken at a detailed level of approximately one boring per hectare A total of 5 borings and 6 riddle location points were assessed 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
- 1 3 The work was carried out by members of the Resource Planning Team in the Huntingdon Statutory Group of ADAS
- 1 4 At the time for survey the agricultural land was under cereals
- 1 5 Previous ALC field survey work has been carried out nearby at Site A, Swale Local Plan (Ref No 2011/046/94)
- 1 6 The distribution of the grades and subgrades is shown on the attached ALC map and the areas are given in the table below The map has been drawn at a scale of 1:10 000 It is accurate at this scale but any enlargement would be misleading This map supersedes any previous survey information for this site

Table 1 Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site	% of Agricultural Area
1	1.3	29.5	29.5
2	2.6	59.1	59.1
3b	0.5	11.4	11.4
Total	4.4 ha	100%	100% (4.4 ha)

- 1 7 A general description of the grades subgrades and land use categories is provided in Appendix 1 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

1 8 The land quality on the site has been classified as grades 1 2 and subgrade 3b Grade 1 land (excellent quality land) has no or very minor limitations to agricultural use Land graded 2 (very good quality agricultural land) has slight droughtiness and/or topsoil stone restrictions, while land graded 3b (moderate quality agricultural land) occurs where the quantity of topsoil stone significantly reduces the flexibility of the agricultural use of the land

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 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 combination of rainfall and temperature at this site mean that the site is assessed as climatic grade 1

Table 2 Climatic Interpolation

Grnd Reference	TQ 900 618
Altitude (m, AOD)	45
Accumulated Temperature (° days Jan-June)	1450
Average Annual Rainfall (mm)	685
Field Capacity Days	138
Moisture Deficit wheat (mm)	113
Moisture Deficit potatoes (mm)	108
Overall Climatic Grade	1

3 0 Relief

3 1 The two areas comprising the sites lie in the lower valley slopes and valley floor with altitude ranging approximately 50 m AOD in the south to around 42 m AOD in the north Neither altitude nor gradient constitute a limitation to land quality

4 0 Geology and Soils

4 1 The published geology map for the site area, ^{Upper} (BGS Sheet 272 Chatham, 1977) shows the southern area to be underlain by ~~Middle~~ Chalk On the western boundary of the southern area and the entire northern area, the Chalk is overlain by Head Brickearth

4 2 The published soils information for the area (SSEW 1983 Sheet 6 1 250 000) shows the site to comprise the Coombe 1 association, described as well drained calcareous fine silty soils deep in valley bottoms and shallower to chalk on valley sides

5 0 **Agricultural land Classification**

5 1 The ALC classification of the site is shown on the attached ALC map

5 2 The location of the soil observation points is shown on the attached sample point map Local pit information supplemented auger boring records

Grade 1

5 3 The grade 1 land occurs in the northern area Soils typically comprise very slightly stony silt loam or medium silty clay loam topsoils over silt loam or medium silty clay loam upper subsoils over medium silty clay loam lower subsoils Subsoils are occasionally very slightly stony containing small brick pieces and some brick dust This is possibly indicative of past disturbance but does not impose a limitation on ALC grade The presence of silt within these soils ensures high quantities of soil moisture are available for crop growth Consequently the land has been classified as grade 1

Grade 2

5 4 The grade 2 land covers most of the southern area Soils generally comprise medium silty clay loam topsoils over heavy silty clay loam upper subsoils which merge into heavy silty clay loams or silty clays Occasionally profiles comprise silt loam topsoils over medium silty clay loam subsoils This area is limited to ALC grade 2 on the basis of minor droughtiness which is caused by the slightly reduced available moisture reserves of these better bodied soils Land may be limited by topsoil stoniness (as assessed by riddling) where the stone abundance is in the range of 5-9% >2 cms in size At these locations the presence of stones in the topsoils slightly hinders the successful germination of seedlings thus excluding the land from a higher grade

Subgrade 3b

5 5 Land graded 3b covers a narrow band along the south boundary of the southern area This land is limited to subgrade 3b on the basis of significant topsoil stoniness caused perhaps by previous disturbance The topsoil comprises 10-18% (by volume) hard stones larger than 6 cm in size, some of which are half bricks

REFERENCES

GEOLOGICAL SURVEY OF ENGLAND AND WALES, 1977 Sheet 272 Chatham,
scale 1 63 360

MAFF 1971 Agricultural Land Classification Map No 172 Scale 1 63 360

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

METEOROLOGICAL OFFICE 1989 Published climatic data extracted from the
agroclimatic dataset compiled by the Meteorological Office

SOIL SURVEY OF ENGLAND AND WALES 1983 Soils of South East England
Sheet 6, 1 250,000 scale

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 of 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 in 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 farmland predominates The remainder is very poor quality land in Grade 5 which most occurs in the uplands

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 include 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 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 levels of yields It is mainly suited to grass with occasional arable crops (eg cereals and forage crops) the yield of which are variable In most 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 (e.g. polythene tunnels erected for lambing) may be ignored

Open water

Includes lakes, ponds and rivers as map scale permits

Land not surveyed

Where the land use includes more than one of the above land cover types e.g. 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 2

FIELD ASSESSMENT OF SOIL WETNESS CLASS

Definition of Soil Wetness Classes

Wetness Class	Duration of Waterlogging¹
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 <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

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

Appendix 3

SOIL BORING DESCRIPTIONS

Contents

- * Soil boring descriptions
- * Soil Abbreviations Explanatory Note

SAMPLE	DEPTH	TEXTURE	COLOUR	---MOTTLES---		PED COL	--- STONES---		STRUCT/ CONSIST	SUBS			CALC	
				COL	ABUN CONT		GLEYS	>2 >6		LITH	TOT	SIR		POR
1	0-30	mzcl	10YR43 00				4	0	HR	4				Y
	30-120	mzcl	10YR44 00				0	0	HR	2	M			
2	0-30	zl	10YR43 00				4	0	HR	4				Y
	30-50	zl	10YR54 00				0	0		0	M			
	50-120	mzcl	10YR54 00				0	0		0	M			
3	0-30	zl	10YR43 00				2	6	HR	8				
	30-120	mzcl	10YR56 00				0	0	HR	8	M			
4	0-35	mzcl	10YR44 00				1	6	HR	7				Y
	35-80	hzcl	10YR56 00				0	0	HR	12	M			Y
	80-120	hzcl	10YR54 00	10YR68 00 C		10YR54 00	0	0	HR	5	M			
5	0-30	mzcl	10YR44 00				2	6	HR	8				TS STONE
	30-80	hzcl	10YR56 00				0	0	HR	12	M			
	80-120	zc	10YR56 00				0	0	HR	20	P			

SAMPLE	ASPECT		--WETNESS--				WHEAT		-POTS-		M REL		EROSN	FROST	CHEM	ALC	COMMENTS
	GRID REF	USE	GRDNT	GLEY	SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT	
1	TQ90006190	WHT E	01	000		1	1	155	42	120	12	1				1	
2	TQ90006180	WHT E	02	000		1	1	180	67	144	36	1				1	
3	TQ90006170	WHT E	02	000		1	1	160	47	127	19	1			ST	2	
4	TQ90006160	WHT NW	01	000		1	1	149	36	115	7	2			DR	2	TS STONE
5	TQ90106160	WHT NW	01	000		1	1	132	19	113	5	2			DR	2	TS STONE

Appendix 3 (Cont)

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	PAS/PGR - permanent pasture
WHT - wheat	RGR - rough grazing
BAR - barley	LEY ley grassland
CER - cereals	CFW - coniferous woodland
OAT - oats	DCW - deciduous woodland
MZE - maize	SCR - scrub
OSR - oilseed rape	HTH - heathland
BEN - field beans	BOG - bog or marsh
BRA - brassicae	FLW - fallow
POT - potatoes	PLO - ploughed
SBT - sugar beet	SAS - set-aside
FDC - fodder crops	OTH - other
FRT - soft and top fruit	LIN - linseed
HOR/HRT - horticultural crops	

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
EROSN Soil erosion) considered significant in terms of
EXP Exposure) the assessment of agricultural land
FROST Frost prone) quality a 'y' will be entered in the
DIST Disturbed land) relevant column
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
TX - soil texture	ST - topsoil stoniness
DP - soil depth	

PROFILES AND 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)

Other possible texture classes include

OL - organic loam

P - peat

SP - sandy peat

LP - loamy peat

PL - peaty loam

PS - peaty sand

MZ - marine light silts

2 MOTTLE COL Mottle colour

3 MOTTLE ABUN Mottle abundance

F - few - less than 2% of matrix or surface described

C - common - 2-20% of the matrix

M - many - 20-40% of the matrix

VM - very many - 40% + of the matrix

4 MOTTLE CONT Mottle continuity

F - faint - indistinct mottles evident only on close examination

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 Stone lithology One of the following is used

HR - all hard rocks or stones

MSST - soft medium or coarse grained sandstone

SI - soft weathered igneous or metamorphic

SLST - soft oolitic or dolomitic 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 (>2 cm, >6 cm 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 well developed

- 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

Other possible texture classes include

- OL - organic loam
- P - peat
- SP - sandy peat
- LP - loamy peat
- PL - peaty loam
- PS - peaty sand
- MZ - marine light silts

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- 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