

AGRICULTURAL LAND CLASSIFICATION SUMMARY REPORT

SWALE BOROUGH LOCAL PLAN SITE 40, FROGNALL LANE, TEYNHAM, KENT 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 Teynham. This work was in connection with the Swale Borough Local Plan Kent.
- 1 2 Approximately 4.5 hectares of land relating to Swale Borough Local Plan was surveyed in October 1994. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 5 borings and 1 soil inspection pit 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 of survey the agricultural land use was bare soil and cereals.
- 1 5 Previous ALC survey work has been carried out nearby for the Swale Borough Local Plan Reference (2011/127/92 site 23) (2011/132/94 site CC) (2011/133/94 site DD) (2011/137/94 site HH) (2011/138/94 site II) and (2011/139/94 site JJ).
- 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
2	4.5	100	100
Total	4.5 ha	100%	100% (4.5 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 grade 2 (very good quality land) as a result of minor droughtiness limitations

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 on 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 a climatic grade of 1

Table 2 Climatic Interpolation

Grid Reference	TQ947626
Altitude (m AOD)	14
Accumulated Temperature (° days Jan-June)	1484
Average Annual Rainfall (mm)	633
Field Capacity Days	126
Moisture Deficit wheat (mm)	118
Moisture Deficit potatoes (mm)	114
Overall Climatic Grade	1

3 0 **Relief**

3 1 The whole site is flat (14 m AOD) and is bounded by Froggnall Lane to the east and the London Road to the south The site is 2-3 metres lower than the adjacent roads because the site has been worked for brickearth extraction at some time in the past

4 0 **Geology and Soils**

4 1 The published geology map for the site area (BGS Sheet 272 Chatham 1977) shows the site to be predominantly underlain by Chalk with a small area of Head Brickearth in the south west corner of the site

4 2 The published soils information for the area (SSEW 1983 Sheet 6 1 250 000) shows the site to comprise the Hamble 1 Association described as deep well drained often stoneless fine silty soils

4 3 The current more detailed survey of soils indicates that because the site has been worked for Brickearth the depth of these silty soils over gravel/chalk is limited to 60/80 cm

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

Grade 2

5 3 The whole site has been assessed as grade 2. Topsoils comprise stoneless or very slightly stony silt loams which are occasionally calcareous overlying calcareous medium silty clay loam silt loam or fine sandy silt loam subsoils. Gravel or chalk is encountered at depth from 60/80 cm. The limited or absence of root exploitation in these lower horizons slightly reduces the available profile water for crop growth. Consequently minor droughtiness imperfections restrict the land to grade 2 (very good quality agricultural land).

ADAS Reference 2011/240/94
MAFF Reference EL20/245B

Resource Planning Team
Huntingdon Statutory Group
ADAS Cambridge

REFERENCES

- GEOLOGICAL SURVEY OF ENGLAND AND WALES 1977 Sheet 272
Chatham 1 50 000 scale
- MAFF 1968 Agricultural Land Classification Map Sheet 172 Provisional 1 63 360
scale
- 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
- SOIL SURVEY OF ENGLAND AND WALES 1984 Soils and their use in South
East England by M G Jarvis *et al* Harpenden

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

<u>Wetness Class</u>	<u>Duration of Waterlogging¹</u>
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 <i>or</i> 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 <i>or</i> 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 <i>or</i> , 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 AND SOIL PIT DESCRIPTIONS

Contents

- * Soil boring descriptions
- * Soil pit description
- * Soil Abbreviations Explanatory Note

program ALC012

LIST OF BORINGS HEADERS 10/13/94 TEYNHAM SITE 40 SWALE LP

page 1

SAMPLE NO	GRID REF	ASPECT USE	GRDNT	GLEYSPL	--WEINNESS--		WHEAT-		-POTS-		M REL		EROSN	FROST EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
					CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD						
1	TQ94706280	PLO		000	1	1	125	7	131	17	2					DR	2	
2	TQ94806280	PLO		000	1	1	113	-5	118	4	3A					DR	3A	PIT=GRADE 2 ON DR
2P	TQ94806280	PLO		000	1	1	141	23	142	28	2					DR	2	
3	TQ94606270	CER		000	1	1	130	12	134	20	2					DR	2	
4	TQ94706270	PLO		000	1	1	142	24	154	40	2					DR	2	
5	TQ94806270	PLO N	01	000	1	1	109	-9	115	1	3A			Y		DR	3A	

SAMPLE	DEPTH	TEXTURE	COLOUR	--- MOTTLES---			PED COL	--- STONES---			STRUCT/ CONSIST	SUBS STR FOR IMP			SPL	CALC
				COL	ABUN	CONT		GLE	>2	>6		LITH	TOT	STR		
1	0-35	z1	10YR43 00					1	0	HR	1					Y
	35-60	mzcl	10YR54 00					0	0	CH	5	MCSAB	FR	M	Y	Y
	60-75	ch	10YR72 00					0	0	CH	99			P	Y	Y
2	0-30	z1	10YR43 00					0	0		0					
	30-50	mzcl	10YR54 00					0	0	HR	1	MCSAB	FR	M	Y	Y
	50-65	ch	10YR72 00					0	0	CH	99			P	Y	Y
2P	0-30	z1	10YR43 00					1	0	HR	1					
	30-50	z1	10YR54 00					0	0	CH	1	MCSAB	FR	M	Y	Y
	50-70	mzcl	10YR54 00					0	0	CH	30	MCSAB	FR	M	Y	Y
	70-85	ch	10YR72 00					0	0	CH	99			P	Y	Y
3	0-28	z1	10YR43 00					2	0	HR	2					Y
	28-80	mzcl	10YR44 00					0	0	CH	1	MCSAB	FR	M	Y	Y
4	0-30	z1	10YR43 00					1	0	HR	1					
	30-45	z1	10YR43 00					0	0		0	MCSAB	FR	M	Y	
	45-70	fsz1	10YR54 00					0	0		0			M	Y	
5	0-30	z1	10YR43 00					1	0	HR	1					
	30-80	mzcl	10YR54 00					0	0	HR	3			P	Y	Y

- Note (1) Pit 2P has rooting 15 cm into the chalk geology and this information has been extrapolated to AB1 Therefore for AB1 AB2 and Pit 2P the droughtiness model has been cut-off 15 cm into the chalk
- (2) AB s 3 4 and 5 overlie hard gravel The droughtiness model has been cut-off immediately at the subsoil/gravel boundary
- (3) The subsoil structure of Pit 2P has been extrapolated across the site where similar subsoils are found The exception is at AB5 where the profile is disturbed In this case a poor structure has been assumed This coupled with the assumption stated in (2) above accounts for the ALC grade of 3a

Appendix 3

SOIL PIT DESCRIPTION

SITE NAME Site 40 Frognall Lane Teynham Pit 1 (near AB2)

Grid Reference	TQ948628	Average Annual Rainfall	633
		Accumulated Temperature	1484
		Field Capacity Days	126
		Land Use	Ploughed
		Slope & Aspect	Flat

Horizon	Texture	Colour	Stones >2	Tot Stone	Mottles	Structure
0-30	ZL	10YR4/3	-	1		-
30 50	ZL	10YR5/4	-	1	NMS	MDCSAB
50 70	MZCL	10YR5/4	-	30	NMS	MDCSAB
70-85	H	10YR7/1	-	-	NMS	-

Wetness Grade	1	Wetness class	1
		Gleying	None
		SPL	None

Drought Grade	2	APW = 141 mm	MBW = 23 mm
		APP = 142 mm	MBP = 28 mm

Final ALC grade 2
Main Limitation Droughtiness

Note This whole field has been worked for brickearth and the site is 2 3 metres lower than adjacent roads This accounts for the reduced depth of the soil over the chalk

CH Hard fragmented chalk rock exploited by roots for 15 cms

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

- 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