AGRICULTURAL LAND CLASSIFICATION REPORT

SWALE BOROUGH LOCAL PLAN

LAND AT TEYNHAM EAST 2, SITE II

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Summary

1 1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality on land at Teynham East 2 Site II This work was in connection with the Swale Borough Local Plan

1 2 Approximately 2 0 hectares of land relating to this area was surveyed in June 1994 The survey was undertaken at a detailed level of approximately one boring per hectare A total of 2 borings 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 the survey the agricultural land use comprised an orchard

1 5 Previous ALC field survey work has been carried out nearby at site 23 Swale Borough Local Plan (Ref No 2011/127/92)

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	2 0	100	100
Total	**2 0 ha**	**100%**	**100% (2 0 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 agricultural land) as a result of minor droughtiness and wetness/workability 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 means that it is classified as climatic grade 1

Table 2 Climatic Interpolation

Grid Reference	TQ 955 626
Altitude (m, AOD)	20
Accumulated Temperature (° days Jan-June)	1476
Average Annual Rainfall (mm)	633
Field Capacity Days	125
Moisture Deficit wheat (mm)	118
Moisture Deficit potatoes (mm)	114
Overall Climatic Grade	1

3 0 **Relief**

3 1 The site comprises fairly level land at an altitude of 20 m AOD Field survey indicated that the site had been worked (early 20th Century) and thus its level was below the adjoining field to the east Despite this neither gradient nor relief impose a limitation on agricultural land quality

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 underlain by Thanet Bed Sands with a small area of Head Brickearth in the northwest corner

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

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 2

5 3 The whole site has been mapped as grade 2* The soils typically comprise medium or heavy silty clay loam topsoils over heavy silty clay loam upper subsoils which merge into gleyed silty clay lower subsoils (45 cms+)

5 4 The site has probably been disturbed during the early part of this century with evidence of fine red brick particles and chalk fragments in the upper layers In addition there is a pit face evident along the eastern boundary where the adjacent unworked field is at a higher level Although there is evidence of disturbance in the soil profile local pit information indicates that the disturbance does not impose a limitation which excludes the land from grade 2

5 5 The presence of gleying and impeded drainage within 70 cm of the surface results in a profile wetness class assessment of II This factor combined with the fine topsoil textures imposes a minor limitation which excludes the land from a higher grade

5 6 Furthermore the available profile water for crop growth is slightly limited due to the presence of fine profile textures and poor structures in the lower subsoils Consequently land has been graded 2 because minor droughtiness and wetness/workability imperfections impose limitations to the flexibility of the land for agricultural use

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Resource Planning Team
Huntingdon Statutory Group
ADAS Cambridge

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* A very small area of subgrade 3a land was noted However it was surrounded by grade 2 land both on site and on adjacent sites within the Local Plan and was therefore considered too small to be delineated separately

REFERENCES

GEOLOGICAL SURVEY OF ENGLAND AND WALES 1977 Sheet 272 Chatham, 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

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

Wetness Class	Duration of Waterlogging[1]
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 *or*, 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 *or*, 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 *or*, 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

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	0-25	mzcl	10YR42 00						0	0	CH	2			Y			Y
	25-45	hzcl	10YR54 00						0	0	CH	5		M	Y			Y
	45-120	zc	10YR53 00	10YR68 00	C			Y	0	0		0		P	Y		Y	
2	0-25	hzcl	10YR42 00						0	0	CH	2			Y			Y
	25-45	hzcl	10YR55 00	10YR68 00	C				0	0	CH	2		M	Y			Y
	45-120	zc	25 Y52 00	10YR68 00	M			Y	0	0		0		P	Y		Y	

BORING	WET CLASS	TEXTURE	TOPSOIL STONES >2	TOPSOIL STONES >6	DEPTH	COLOUR	CaCO3	MOTTLES
1	2	mzcl			0-25	10YR42 00	Y	
		hzcl			25-45	10YR54 00	Y	
		zc			45-120	10YR53 00		common 10YR68 00
2	2	hzcl			0-25	10YR42 00	Y	
		hzcl			25-45	10YR55 00	Y	common 10YR68 00
		zc			45-120	25 Y52 00		many 10YR68 00

SAMPLE NO	GRID REF	USE	ASPECT	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	TQ95506260	HRT	W	01	045	045	2	2	135	17	110	-4	2			Y	DR	2	WE
2	TQ95606260	HRT	W	01	045	045	2	3A	136	18	111	-3	2			Y	WE	3A	DIST

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
WHT - wheat
BAR - barley
CER - cereals
OAT - oats
MZE - maize
OSR - oilseed rape
BEN - field beans
BRA - brassicae
POT - potatoes
SBT - sugar beet
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
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 ⅔ of the sand less than 0 2 mm)
C - coarse (more than ⅓ of sand greater than 0 6 mm)
M - medium (less than ⅔ fine sand and less than ⅓ 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 in 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