

**AGRICULTURAL LAND
CLASSIFICATION REPORT**

SWALE BOROUGH LOCAL PLAN

**LAND AT BAPCHILD,
SITE FF**

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SWALE BOROUGH LOCAL PLAN LAND AT BAPCHILD, SITE FF 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 Bapchild site FF. This work was in connection with the Swale Borough Local Plan.
- 1 2 Approximately 6 hectares of land relating to this area surveyed in June 1994. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 6 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 comprised an orchard and a soft fruit and vegetable enterprise. The non agricultural area includes a small area of allotments.
- 1 5 Previous ALC field survey work has been carried out nearby at site 22, Swale Borough Local Plan (Ref no 2011/127/92) and land at Hempstead House Bapchild (Ref no 2011/083/85).
- 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	5.6	93	100
Non Agricultural	0.4	7	
Total	6.0	100%	100% (5.6 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 1 (excellent quality agricultural land) because the land has no or very minor limitations to agricultural use.

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 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 an overall climatic grade of 1.

Table 2 Climatic Interpolation

Grid Reference	TQ 933 633
Altitude (m, AOD)	12
Accumulated Temperature (° days Jan-June)	1486
Average Annual Rainfall (mm)	622
Field Capacity Days	123
Moisture Deficit wheat (mm)	120
Moisture Deficit potatoes (mm)	117
Overall Climatic Grade	1

3 0 Relief

3 1 The site comprises fairly level land at an average altitude of 12 m AOD. Nowhere on the site does relief or gradient impose a limitation to 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 on the western half of the site with Head Gravel and Brickearth deposits overlying the Thanet Bed Sands to the east.

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

Grade 1

5 3 The whole site has been mapped as grade 1 The soils typically comprise non calcareous silt loam topsoils over non calcareous medium silty clay loam or occasionally heavy silty clay loam upper subsoils which often merge into heavy silty clay loams at depth Occasionally lower subsoils are slightly stony (approx 10% flints) There was no evidence of gleying in the profiles, consequently the wetness class has been assessed as I This factor combined with the flexibility of the topsoils results in no or only very minor wetness and workability limitations Furthermore the available profile water for crop growth is high due to the presence of water retentive soils which are moderately well structured in the subsoil Consequently the land has been graded 1 with no or very minor limitations to agricultural use

ADAS Reference 2011/135/94
MAFF Reference EL 20/245

Resource Planning Team
Huntingdon Statutory Group
ADAS Cambridge

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 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 AND SOIL PIT DESCRIPTIONS

Contents

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

program ALC012

LIST OF BORINGS HEADERS 07/04/94 BAPCHILD

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SAMPLE NO	GRID REF	ASPECT		GRDNT	GLEYSPL	--WETNESS--		-WHEAT-		POTS-		M REL		EROSN	FROST EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
		USE				CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD						
1	TQ93306340	HRT	W	01	000	1	1	173	53	137	20	1					1	NICE	
2	TQ93206330	FRT	W	01	000	1	1	162	42	126	9	2				DR	2	BORDER	
3	TQ93306330	HRT	W	01	000	1	1	173	53	137	20	1					1	WM CHAN	
4	TQ93406330	HRT	W	01	000	1	1	167	47	135	18	1					1		
5	TQ93206320	FRT	W	01	000	1	1	173	53	137	20	1					1		
6	TQ93306320	FRT	NE	01	000	1	1	173	53	137	20	1					1		

program alc034

AUGER BORINGS LIST 07/04/94 BAPCHILD

page 1

BORING	WET CLASS	TEXTURE	TOPSOIL STONES		DEPTH	COLOUR	CaCO3	MOTTLES
			>2	>6				
1	1	zl			0-30	10YR44	00	
		mzcl			30-70	10YR54	00	
		hzcl			70-120	10YR56	00	few 10YR66 00
2	1	mzcl			0-35	10YR44	00	
		hzcl			35-80	10YR56	00	
		hzcl			80-120	10YR54	00	few 10YR68 00
3	1	zl			0-30	10YR44	00	
		mzcl			30-120	10YR56	00	
4	1	zl			0-30	10YR44	00	
		mzcl			30-60	10YR54	00	
		hzcl			60-120	10YR56	00	
5	1	zl			0-30	10YR44	00	
		mzcl			30-120	10YR54	00	
6	1	zl			0-30	10YR44	00	
		hzcl			30-120	10YR56	00	

program ALC011

COMPLETE LIST OF PROFILES 07/04/94 BAPCHILD

page 1

SAMPLE	DEPTH	TEXTURE	COLOUR	-- MOTTLES ----			PED COL	----STONES----			STRUCT/ CONSIST	SUBS			
				COL	ABUN	CONT		GLE	>2	>6		LITH	TOT	STR	FOR
1	0-30	z1	10YR44 00					0	0	0				Y	
	30-70	mzcl	10YR54 00					0	0	0			M	Y	
	70-120	hzcl	10YR56 00	10YR66 00	F			0	0	0			M	Y	
2	0-35	mzcl	10YR44 00					0	0	0				Y	
	35-80	hzcl	10YR56 00					0	0	0			M	Y	
	80-120	hzcl	10YR54 00	10YR68 00	F			0	0	0			M	Y	
3	0-30	z1	10YR44 00					0	0	0					
	30-120	mzcl	10YR56 00					0	0	0			M		
4	0-30	z1	10YR44 00					0	0	0					
	30-60	mzcl	10YR54 00					0	0	0			M		
	60-120	hzcl	10YR56 00					0	0	HR 10			M		
5	0-30	z1	10YR44 00					0	0	0				Y	
	30-120	mzcl	10YR54 00					0	0	0			M	Y	
6	0-30	z1	10YR44 00					0	0	0				Y	
	30-120	hzcl	10YR56 00					0	0	0			M	Y	

SOIL PIT DESCRIPTION

SITE FF - BAPCHILD PIT 1 (Near AB6)

G R	TQ 91006230	AAR	622 mm
		ATO	1486° days
		FCD	123
		Land Use	Fruit orchard and vegetables
		Slope & Aspect	1 0° northeast

Horizon	Texture	Colour	Stones >2	Tot Stone	Mottles	Structure
0-30	ZL	10YR4/3	1%	1		-
30-80	MZCL	10YR5/5	-	<1	None	MDCSAB
80-120	MZCL	10YR5/5	-	<1	None	SDCP

Biopores >0.5%

Wetness Grade	1	Wetness class	I
		Gleying	None
		SPL	None

Drought Grade	1	APW = 172 mm	MBW = 52 mm
		APP = 136 mm	MBP = 19 mm

Final ALC grade	1
Limitations	None

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 **GLEYSPL** 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