A1

MEDWAY TOWNS LOCAL PLAN
Grange Farm, Gillingham, Kent

Agricultural Land Classification

May 1996

Resource Planning Team
Guildford Statutory Group
ADAS Reading

ADAS Reference: 2005/066/96
MAFF Reference: EL 20/1376
LUPU Commission: 2532

AGRICULTURAL LAND CLASSIFICATION REPORT

MEDWAY TOWNS LOCAL PLAN
GRANGE FARM, GILLINGHAM

Introduction

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 9.2 ha of land at Grange Farm which is located on the northern side of Gillingham. The survey was carried out in May 1996.

2. The survey was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF) from its Land Use Planning Unit in Reading in connection with the Medway Towns Local Plan. This survey supersedes previous ALC surveys on this land.

3. The work was carried out under sub-contracting arrangements by NA Duncan & Associates and was supervised by members of the Resource Planning Team in the Guildford Statutory Group of ADAS. The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF, 1988). A description of the ALC grades and subgrades is given in Appendix I.

4. At the time of survey part of the was under permanent grass and used for grazing sheep and horses, whilst the remainder was under regenerated volunteer oats.

Summary

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10,000. It is accurate at this scale but any enlargement would be misleading.

6. The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% Total site area	% Surveyed area
2	8.0	87.0	100.0
Other land	1.2	13.0	-
Total survey area	8.0	-	100.0
Total site area	9.2	100.0	-

7. The fieldwork was conducted at an average density of one auger boring per hectare. A total of 8 borings and one soil pit were described.

8. All the agricultural land on the site has been mapped as Grade 2, very good quality land. The soils on the site typically comprise free draining, fine silty deposits, having medium silty clay loam topsoils overlying similar textured subsoil horizons. Moisture balance calculations indicate that in this low rainfall area such soils will have a minor droughtiness limitation, restricting the land quality to Grade 2. Included within the area however, are localised profiles of Grade 1 quality, where the available water capacity is greater due to silt loam topsoil textures, but it is not possible to delineate these areas separately at this scale.

FACTORS INFLUENCING ALC GRADE

Climate

9. Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.

10. The key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5km grid datasets using the standard interpolation procedures (Met. Office, 1989).

Table 2: Climatic and altitude data

Factor	Units	Values
Grid reference	N/A	TQ 793 685
Altitude	m, AOD	15
Accumulated Temperature	day°C	1483
Average Annual Rainfall	mm	619
Field Capacity Days	days	123
Moisture Deficit, Wheat	mm	124
Moisture Deficit, Potatoes	mm	120

11. 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.

12. The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR), as a measure of overall wetness, and accumulated temperature (ATO, January to June), as a measure of the relative warmth of a locality.

13. The combination of rainfall and temperature at this site mean that the area is relatively dry and warm. The site is not considered to be exposed or subject to any particular frost risk and as such no climatic limitation exists on this site; the site is climatic Grade 1.

Site

14. The altitude of the site ranges from approximately 17 m AOD on the southern boundary to approximately 7 m AOD alongside Lower Rainham Road. Gradients on the site

are relatively gentle and nowhere are limiting in terms of ALC grading. The site is not subject to flooding and therefore there are no site limitations that will affect the grading of the area.

Geology and soils

15. The published geological information (BGS, 1977), shows the site to be mainly underlain by Thanet Beds, with Chalk occurring to the south and east of the site.

16. There is no detailed soil map for this area, but the reconnaissance soil survey map (SSEW, 1983) shows the site to comprise soils of the Hamble 1 association, which are described as "deep, well drained often stoneless fine silty soils, together with similar soils often affected by groundwater. The association includes some shallower soils over chalk."

AGRICULTURAL LAND CLASSIFICATION

17. The details of the classification of the site are shown on the attached ALC map and the area statistics of each grade are given in Table 1, page 1

18. The location of the auger borings and pits is shown on the attached sample location map and the details of the soils data are presented in Appendix III.

Grade 2

19. All the agricultural land on the site has been mapped as Grade 2, very good quality land, and the soils typically comprise free-draining fine silty deposits. A typical soil profile has a slightly stony, medium silty clay loam topsoil over a brown, stoneless heavy silty clay loam upper subsoil, which becomes lighter textured with depth. The subsoils often show faint ochreous mottling, increasing with depth, but the subsoils are not considered to be slowly permeable due to abundant coarse porosity throughout the profile. The soils are therefore assessed as Wetness Class I (see Appendix II). Moisture balance calculations indicate that in this low rainfall area these soils are slightly droughty especially for the shallower rooting crops. Included within the site are individual profiles of Grade 1 potential, where the available water capacity of the soil is slightly greater due to the presence of silt loam topsoil textures. However it is not possible to delineate these areas separately at this scale of mapping.

NA Duncan
for Resource Planning Team
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1977) *Sheet No.* 272. BGS: London.

Ministry of Agriculture, Fisheries and Food (1988) *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land*. MAFF: London.

Met. Office (1989) *Climatological Data for Agricultural Land Classification*. Met. Office: Bracknell.

Soil Survey of England and Wales (1983) *Sheet* 6, *South East England.* SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in South East England* SSEW: Harpenden

APPENDIX I

DESCRIPTIONS OF THE GRADES AND SUBGRADES

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 of this 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 land.

Grade 3: Good to Moderate Quality Land

Land with moderate limitations which affect the choice of crops, the 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.

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 the level of yields. It is mainly suited to grass with occasional arable crops (e.g. 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 severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

APPENDIX II

SOIL WETNESS CLASSIFICATION

Definitions of Soil Wetness Classes

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six soil wetness classes are identified and are defined in the table below.

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 only wet within 40 cm depth for 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 present within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31-90 days in most years.
IV	The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth for more than 210 days in most years **or**, if there is no slowly permeable layer present 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.

Assessment of Wetness Class

Soils have been allocated to wetness classes by the interpretation of soil profile characteristics and climatic factors using the methodology described in *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land* (MAFF, 1988).

[1] The number of days is not necessarily a continuous period.
[2] 'In most years' is defined as more than 10 out of 20 years.

APPENDIX III

SOIL DATA

Contents:

SOIL PROFILE DESCRIPTIONS: EXPLANATORY NOTE

Soil pit and auger boring information collected during ALC fieldwork is held on a computer database. This uses notations and abbreviations as set out below.

Boring Header Information

1. **GRID REF**: national 100 km 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	**FLW**:	Fallow
PGR:	Permanent Pasture	**LEY**:	Ley Grass	**RGR**:	Rough Grazing
SCR:	Scrub	**CFW**:	Coniferous Woodland	**DCW**:	Deciduous Wood
HTH:	Heathland	**BOG**:	Bog or Marsh	**FLW**:	Fallow
PLO:	Ploughed	**SAS**:	Set aside	**OTH**:	Other
HRT:	Horticultural Crops				

3. **GRDNT**: Gradient as estimated or measured by a hand-held optical clinometer.

4. **GLEY/SPL**: Depth in centimetres (cm) to gleying and/or slowly permeable layers.

5. **AP (WHEAT/POTS)**: Crop-adjusted available water capacity.

6. **MB (WHEAT/POTS)**: Moisture Balance. (Crop adjusted AP - crop adjusted MD)

7. **DRT**: Best grade according to soil droughtiness.

8. If any of the following factors are considered significant, 'Y' will be entered in the relevant column.

MREL:	Microrelief limitation	**FLOOD**:	Flood risk	**EROSN**:	Soil erosion risk
EXP:	Exposure limitation	**FROST**:	Frost prone	**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**:	Erosion Risk	**WD**:	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
ZL:	Silt 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 the following 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 using Munsell notation.

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 using Munsell notation.

6. **GLEY**: If the soil horizon is gleyed a 'Y' will appear in this column. If slightly gleyed, an 'S' will appear.

7. **STONE LITH**: Stone Lithology. One of the following is used:

HR:	all hard rocks and stones	**SLST**:	soft oolitic or dolimitic limestone
CH:	chalk	**FSST**:	soft, fine grained sandstone
ZR:	soft, argillaceous, or silty rocks	**GH**:	gravel with non-porous (hard) stones
MSST:	soft, medium grained sandston	**GS**:	gravel with porous (soft) stones
SI:	soft weathered igneous/metamorphic rock		

Stone contents (>2cm, >6cm and total) are given in percentages (by volume).

8. **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	

9. **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

10. **SUBS STR**: Subsoil structural condition recorded for the purpose of calculating profile droughtiness:
G: good **M**: moderate **P**: poor

11. **POR**: Soil porosity. If a soil horizon has less than 0.5% biopores >0.5 mm, a 'Y' will appear in this column.

12. **IMP**: If the profile is impenetrable to rooting a 'Y' will appear in this column at the appropriate horizon.

13. **SPL**: Slowly permeable layer. If the soil horizon is slowly permeable a 'Y' will appear in this column.

14. **CALC**: If the soil horizon is calcareous, a 'Y' will appear in this column.

15. 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.

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	TQ793 687	PGR	N	03	065		1	1	174	50	138	18	1					1	
1P	TQ793 684	FLW	NW	02	027		2	2	161	37	123	3	2				DR	2	WE
2	TQ794 687	FLW	NE	02	000		1	1	099	-25	106	-14	3B				DR	3A	
3	TQ793 686	FLW	N	01	030		1	1	166	42	124	4	2				DR	2	
4	TQ794 686	FLW	NE	02	045		1	1	160	36	124	4	2				DR	2	
5	TQ792 685	FLW	W	01	000		1	1	157	33	121	1	2				DR	2	
6	TQ793 684	FLW	NW	02	030		1	1	000	0	000	0					DR	2	
7	TQ794 684	FLW	NE	01	055		1	2	152	28	120	0	2				DR	2	WE
8	TQ794 685	FLW	W	01	000		1	1	169	45	133	13	1					1	

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL.	PED GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC
1	0-35	zl	10YR32 00						0	0	HR	2						
	35-65	mzcl	10YR44 00						0	0		0		M				
	65-120	hzcl	25Y 54 64	10YR58 00	C			S	0	0		0		M				
1P	0-27	mzcl	10YR43 00						2	0	HR	2						
	27-40	hzcl	10YR64 00	10YR68 00	C		10YR64 00	Y	0	0		0	MDVCSB	FM	M			
	40-90	mzcl	25Y 64 00	10YR66 00	C		25Y 64 00	Y	0	0		0	STVCSB	FM	M			
	90-100	zl	25Y 63 64	10YR68 00	C		25Y 63 00	Y	0	0		0	MDVCSB	FR	M			
	100-120	zl	25Y 64 00	10YR68 00	M			Y	0	0		0	MDCPL	FM	P			
2	0-35	mzcl	10YR32 00						2	0	HR	4						
	35-60	mzcl	10YR43 00						0	0	HR	2		M				
	60-70	mzcl	10YR54 00						0	0	HR	15		M				
3	0-30	mzcl	10YR32 00						1	0	HR	2						
	30-60	mzcl	25Y 63 00	10YR66 00	F			S	0	0		0		M				
	60-105	mzcl	25Y 63 00	10YR66 00	C			Y	0	0		0		M				
	105-120	zl	05Y 72 00	10YR56 00	C			Y	0	0		0		M				
4	0-30	mzcl	10YR43 00						2	0	HR	2						
	30-45	mzcl	10YR44 00						0	0		0		M				
	45-90	hzcl	25Y 64 00	10YR68 00	C			Y	0	0		0		M				
	90-120	mzcl	25Y 63 00	10YR68 00	C			Y	0	0		0		M				
5	0-35	mzcl	10YR33 00						6	0	HR	6						
	35-90	hzcl	10YR45 00						0	0	HR	2		M				
	90-120	hzcl	75YR55 00						0	0		0		M				
6	0-30	mzcl	10YR43 00						2	0	HR	2						
	30-90	hzcl	10YR64 00	10YR66 00	C			S	0	0		0		M				
	90-120	zl	25Y 64 00	10YR66 00	M			Y	0	0		0						
7	0-30	hzcl	10YR33 00						4	0	HR	4						
	30-55	hzcl	25Y 54 00						0	0		0		M				
	55-90	zc	25Y 64 00	10YR66 68	C			S	0	0		0		M				
	90-120	mzcl	25Y 63 00					S	0	0		0		M				
8	0-28	zl	10YR43 00						5	0	HR	5						
	28-70	mzcl	10YR45 00						0	0		0		M				
	70-120	hzcl	75YR56 00						0	0		0		M				

SOIL PIT DESCRIPTION

Site Name : GILLINGHAM, GRANGE FARM Pit Number : 1P

Grid Reference: TQ793 684 Average Annual Rainfall : 619 mm
Accumulated Temperature : 1483 degree days
Field Capacity Level : 123 days
Land Use : Fallow
Slope and Aspect : 02 degrees NW

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 27	MZCL	10YR43 00	2	2	HR					
27- 40	HZCL	10YR64 00	0	0		C	MDVCSB	FM	M	
40- 90	MZCL	25Y 64 00	0	0		C	STVCSB	FM	M	
90-100	ZL	25Y 63 64	0	0		C	MDVCSB	FR	M	
100-120	ZL	25Y 64 00	0	0		M	MDCPL	FM	P	

Wetness Grade : 2 Wetness Class : II
Gleying :027 cm
SPL : No SPL

Drought Grade : 2 APW : 161mm MBW : 37 mm
APP : 123mm MBP : 3 mm

FINAL ALC GRADE : 2
MAIN LIMITATION : Droughtiness