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Medway Towns Local Plan
Land NE of Hoo St Werburgh

Agricultural Land Classification
May 1996

Resource Planning Team
Guildford Statutory Group
ADAS Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

MEDWAY TOWNS LOCAL PLAN
LAND NE OF HOO ST WERBURGH

Introduction

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 6.1 ha of land on the north eastern boundary of Hoo St Werburgh. 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 conducted 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, the northern half of the site comprised four small paddocks of rough grass with a disused stable block, whilst to the south the land was in permanent grass being grazed by cattle. A house, garden and stable block have been mapped as 'Other Land'.

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
3a	2.7	44.2	47.4
3b	3.0	49.2	52.6
Other	0.4	6.6	-
Total survey area	5.7	-	100.0
Total site area	6.1	100.0	N/A

7. The fieldwork was conducted at an average density of one auger boring per hectare. A total of 6 borings and 2 soil pits were described.

8. Subgrade 3a, good quality agricultural land has been mapped on the slightly higher land on the western side of the site. This area mainly comprises fine loamy soils overlying slowly permeable clay at depth. The soils typically have a heavy clay loam topsoil overlying a mottled heavy clay loam or sandy clay loam upper subsoil, which in turn overlies slowly permeable mottled clay. The depth to the underlying clay is variable, but is typically below 60 cm depth. These soils have been assessed as Wetness Class II and under the prevailing climatic conditions have a moderate wetness and workability limitation restricting the land quality to Subgrade 3a.

9. Moderate quality agricultural land, Subgrade 3b, has been mapped on the slightly lower land on the eastern side of the site. In this area heavy textured soils developed on London Clay have been mapped. These soils typically have a heavy clay loam topsoil, overlying a mottled, slowly permeable clay subsoil. In some profiles a strongly mottled heavy clay loam upper subsoil horizon may occur. These soils are assessed as Wetness Class III and therefore have a moderately severe wetness and workability limitation, restricting the versatility of the land, principally in terms of timing of cultivations and stocking, if structural damage to the soils is to be avoided.

Factors Influencing ALC Grade

Climate

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

11. 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 780 731
Altitude	m, AOD	47
Accumulated Temperature	day°C	1445
Average Annual Rainfall	mm	617
Field Capacity Days	days	116
Moisture Deficit, Wheat	mm	122
Moisture Deficit, Potatoes	mm	118

12. 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.

13. 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.

14. The combination of rainfall and accumulated temperature at this site mean that the area is relatively dry and warm. Climatic factors do interact with soil properties to influence soil wetness and droughtiness limitations. The crop-adjusted soil moisture deficits at this locality are above the average for the south-east of England. This increases the likelihood of soil droughtiness limitations. No local climatic factors, such as exposure and frost risk, are believed to adversely affect the land quality on the site. This site is climatically Grade 1.

Site

15. The site slopes gently from west to east from a high point of approximately 53 m AOD alongside Bells Lane, to 45 m AOD along the eastern boundary. The land is not subject to flooding and consequently there are no site limitations that will affect the grading of the land.

Geology and soils

16. The published geological information (BGS, 1978) shows the solid geology of the area to be London Clay, which is overlain by head.

17. There is no detailed published soil map for this district but the reconnaissance soil survey map (SSEW, 1983) shows the northern part of the site as the Windsor association, with the Ratsborough association to the south and east. Ratsborough soils are developed on thick drift of varied origin and can be highly variable in nature. They are described as 'fine silty or fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging, with some slowly permeable seasonally waterlogged fine loamy over clayey and clayey soils.' (SSEW, 1983). Windsor soils, which are developed in London Clay, are described as 'slowly permeable, seasonally waterlogged clayey soils mostly with brown subsoils.' (SSEW, 1983).

Agricultural Land Classification

18. 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.

19. 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.

Subgrade 3a

20. Subgrade 3a, good quality, land has been mapped on the slightly higher land on the western side of the site. This area mainly comprises loamy soils overlying slowly permeable clay at depth. The soils typically have a heavy clay loam topsoil overlying a permeable mottled heavy clay loam or sandy clay loam upper subsoil. Lower subsoils comprise slowly permeable mottled clay. The depth to the underlying clay is variable, but is typically below 60 cm depth. These profiles are typified by Pit 2. Given the local climate, these profiles are assessed as moderately well drained (Wetness Class II, see Appendix II). The interaction between the soil drainage status and heavy textured topsoils is partially offset by the dry

prevailing climate, such that this land is limited by moderate soil wetness and workability. This may result in some restrictions on the flexibility of cropping, stocking and cultivations.

Subgrade 3b

21. Subgrade 3b, moderate quality, land has been mapped on the slightly lower land on the eastern side of the site. This land is subject to significant soil wetness and workability limitations resulting from soils derived from the underlying London Clay. These soils typically have a non calcareous heavy clay loam topsoil, overlying a slowly permeable mottled clay subsoil. In some profiles a permeable, strongly mottled, heavy clay loam upper subsoil horizon may occur. These profiles, which are represented by Pit 1, are assessed as Wetness Class III. The interaction between the soil drainage status and the heavy textured topsoils is partially offset by the very dry local climate such that Subgrade 3b is appropriate. This land has a significant wetness and workability limitation, restricting the versatility of the land, principally in terms of the timing of cultivations and stocking, if structural damage to the soils is to be avoided.

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SOURCES OF REFERENCE

British Geological Survey (1978) *Sheet No. 272, Chatham, 1:50,000.*
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, Soils of South East England, 1:250, 000 and accompanying legend.*
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 sandstone	**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 **ST**: strongly developed	**MD**: moderately developed
ped size	**F**: fine **C**: coarse	**M**: medium **VC**: very coarse
ped shape	**S** : single grain **GR**: granular **SAB**: sub-angular blocky **PL**: platy	**M**: massive **AB**: angular blocky **PR**: prismatic

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 appropiate 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

SOIL PIT DESCRIPTION

Site Name : MEDWAY LP,HOO ST WERBURG Pit Number : 1P

Grid Reference: TQ78107310
Average Annual Rainfall : 617 mm
Accumulated Temperature : 1445 degree days
Field Capacity Level : 116 days
Land Use : Permanent Grass
Slope and Aspect : 02 degrees NE

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 22	HCL	10YR33 00	2	4	HR					
22- 35	HCL	10YR43 53	0	4	HR	C	MDMSAB	FR	M	
35- 53	HCL	10YR53 00	0	8	HR	M	MDVCSB	FM	M	
53-120	C	10YR63 00	0	0		M	MDVCPR	FM	P	

Wetness Grade : 3B
Wetness Class : III
Gleying :022 cm
SPL :053 cm

Drought Grade : 3A
APW : 130mm MBW : 8 mm
APP : 107mm MBP : -11 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : MEDWAY LP,HOO ST WERBURG Pit Number : 2P

Grid Reference: TQ77907310 Average Annual Rainfall : 617 mm
Accumulated Temperature : 1445 degree days
Field Capacity Level : 116 days
Land Use : Rough Grazing
Slope and Aspect : 02 degrees NE

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 25	HCL	10YR43 00	0	2	HR					
25- 37	HCL	10YR54 00	0	3	HR	F	MDCSAB	FM	M	
37- 85	SCL	10YR64 00	0	0		M	MDVCSB	FR	M	
85-120	C	75YR62 00	0	0		C			P	

Wetness Grade : 3A Wetness Class : II
Gleying :037 cm
SPL :085 cm

Drought Grade : 2 APW : 142mm MBW : 20 mm
APP : 112mm MBP : -6 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Wetness

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	TQ77907320	RGR	NE	02	027		2	2		0		0					WE		2	
1P	TQ78107310	PGR	NE	02	022	053	3	3B	130	8	107	-11	3A				WE		3B	
2	TQ77987321	RGR	NE	02	027	027	3	3B		0		0					WE		3B	
2P	TQ77907310	RGR	NE	02	037	085	2	3A	142	20	112	-6	2				WE		3A	
3	TQ77907310	RGR	NE	02	040	095	2	3A		0		0					WE		3A	
4	TQ78007310	PGR	NE	02	030	030	3	3B		0		0					WE		3B	
5	TQ78107310	PGR	NE	02	022	050	3	3B		0		0					WE		3B	
6	TQ78007300	PGR	E	01	060	060	2	3A		0		0					WE		3A	S1.gley28;I105

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	0-27	mcl	10YR33 00						1	0	HR	2							
	27-55	hcl	10YR53 63	75YR56 00	C			Y	0	0	HR	2		M					
	55-120	scl	10YR63 00	75YR56 00	C			Y	0	0	HR	2		M					
1P	0-22	hcl	10YR33 00						2	0	HR	4							
	22-35	hcl	10YR43 53	10YR56 00	C			Y	0	0	HR	4	MDMSAB	FR M					
	35-53	hcl	10YR53 00	10YR58 00	M		00MN00 00	Y	0	0	HR	8	MDVCSB	FM M					
	53-120	c	10YR63 00	75YR56 00	M			Y	0	0		0	MDVCPR	FM P	Y		Y		
2	0-27	hcl	10YR32 00	75YR46 00	F				1	0	HR	3							
	27-90	c	10YR63 00	10YR66 00	C		00MN00 00	Y	0	0		0		P			Y		
	90-120	c	10YR63 00	10YR66 00	F			S	0	0		0		P			Y	Y	Q common motts
2P	0-25	hcl	10YR43 00						0	0	HR	2							
	25-37	hcl	10YR54 00	10YR56 00	F				0	0	HR	3	MDCSAB	FM M					
	37-85	scl	10YR64 00	10YR68 00	M			Y	0	0		0	MDVCSB	FR M					
	85-120	c	75YR62 00	75YR56 00	C			Y	0	0		0		P	Y		Y		
3	0-25	hcl	10YR43 00						0	0	HR	2							
	25-40	hcl	10YR54 00	75YR56 00	F				0	0	HR	2		M					
	40-95	scl	10YR64 00	75YR56 00	C			Y	0	0		0		M					
	95-120	c	75YR62 00	75YR56 00	C			Y	0	0		0		P			Y		
4	0-30	hcl	10YR33 00						0	0	HR	2							
	30-50	c	10YR53 00	10YR56 00	C			Y	0	0		0		P			Y		
	50-120	c	10YR63 00	10YR55 00	C			Y	0	0		0		P			Y		
5	0-22	hcl	10YR33 00	75YR46 00	F				0	0	HR	2							
	22-50	hcl	10YR53 00	75YR56 00	C			Y	0	0	HR	5		M					
	50-90	c	10YR63 00	75YR56 00	M			Y	0	0		0		P			Y		
	90-120	hcl	10YR63 00	75YR58 00	M			Y	0	0	HR	5		M					Query spl
6	0-28	hcl	10YR43 00						0	0	HR	4							
	28-60	hcl	10YR54 00	75YR56 00	C			S	0	0	HR	4		M					
	60-85	c	10YR63 00	75YR56 00	C			Y	0	0		0		P			Y		
	85-105	c	75YR64 00	75YR68 00	M			Y	0	0	HR	5		P			Y		