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Horsham District Local Plan

Land at Tower Hill,

Southwater

Agricultural Land Classification

ALC Map and Report

February 1995

AGRICULTURAL LAND CLASSIFICATION REPORT

HORSHAM DISTRICT LOCAL PLAN
LAND AT TOWER HILL, SOUTHWATER.

1 Summary

1 1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality for a number of sites in the district of Horsham in West Sussex The work forms part of MAFF's statutory input to the preparation of the Horsham District Local Plan

1 2 The site comprises 9 9 hectares of land to the south of Salisbury Road at Tower Hill near Horsham West Sussex An Agricultural Land Classification (ALC) survey was carried out in February 1995 The survey was undertaken at a detailed level of approximately one boring per hectare of agricultural land A total 10 borings and one soil inspection pit were described 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 a long term limitation on its use for agriculture

1 3 The survey work was carried out by members of the Resource Planning Team in the Guildford Statutory Group of ADAS

1 4 At the time of the survey the agricultural land on the site comprised permanent grassland Areas of new planting and coppice have been mapped as woodland on the site Non agricultural land comprises an area of scrubland towards the north of the site

1 5 The distribution of grades and subgrades is shown on the attached ALC map and the areas and extent 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

Table 1 Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site	% of Agricultural Land
3a	1 1	11 1	14 1
3b	6 7	67 7	85 9
Non agricultural	0 2	2 0	100% (7 8 ha)
Woodland	1 9	19 2	
Total area of Site	9 9	100%	

1 6 Appendix I gives a general description of the grades subgrades and land use categories identified in the survey 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 7 The majority of the agricultural land on the site has been classified as Subgrade 3b moderate quality land with soil wetness as the main limitation Soil profiles typically comprise clay loam topsoils resting upon clay subsoils interbedded with soft sandstone which are slowly permeable and significantly impede drainage such that a classification of Subgrade 3b is appropriate Poorly drained wet soils restrict plant growth and development and may be more susceptible to structural damage through trafficking by agricultural machinery or poaching by grazing livestock In the south western corner of the site an area of good quality Subgrade 3a land has been mapped Land in this mapping unit is also affected by a wetness limitation yet the severity of this is diminished due to the deeper depth at which the slowly permeable clay occurs in the profile

2 Climate

2 1 The climatic criteria are considered first when classifying land as climate can be overriding in the sense that severe climatic limitations will restrict land to low grades irrespective of favourable site or soil conditions

2 2 The main parameters used in the assessment of an 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

2 3 A detailed assessment of the prevailing climate was made by interpolation from a 5km gridpoint dataset (Met Office 1989) The details are given in the table below and these show that there is no overall climatic limitation affecting the site

2 4 However climatic factors do interact with soil factors to influence soil wetness and droughtiness limitations At this locality the climate is relatively warm and moist in a regional context which may increase the likelihood of soil wetness limitations

2 5 No local climatic factors such as exposure or frost risk are believed to affect the site

Table 2 Climatic Interpolation

Grid Reference	TQ 161 293
Altitude (m)	65
Accumulated Temperature (degree days Jan-June)	1458
Average Annual Rainfall (mm)	802
Field Capacity (days)	167
Moisture Deficit Wheat (mm)	106
Moisture Deficit Potatoes (mm)	100
Overall Climatic Grade	1

3 Relief

3 1 The site is gently sloping lying at an altitude of approximately 60 70m AOD

4 Geology and Soils

4 1 The relevant geological map (BGS 1972) shows the site to be underlain by lower bed Horsham Stone in Weald Clay

4 2 The published Soil Survey map (SSEW 1983) shows the soils on the site to comprise those of the Wickham 5 association These are described as 'slowly permeable seasonally waterlogged fine loamy over clayey fine silty over clayey and clayey soils' (SSEW 1983)

4 3 Detailed field examination found the soils on the site to be clayey with slowly permeable subsoils Clay subsoils were also found to be interbedded with soft sandstone at various depths

5 Agricultural Land Classification

5 1 The location of the soil observation points are shown on the attached sample point map

Subgrade 3a

5 2 A small area of land towards the south-west of the site has been classified as Subgrade 3a good quality land with soil wetness as the main limitation Soil profiles in this mapping unit typically comprise a medium clay loam topsoil and upper subsoil containing approximately 2 5% total soft sandstone A clay lower subsoil commences at 50 cm with either a medium clay loam or heavy clay loam horizon (containing 10 20% total soft sandstone) resting directly upon the clay Profiles show evidence of a soil wetness imperfection in the form of gleying from either the topsoil or upper subsoil and the clay lower subsoil is poorly structured and slowly permeable Pit 1 provides evidence of the structural condition of the clay Such drainage characteristics equate these soils to Wetness Class III with a resultant classification of Subgrade 3a given the prevailing local climatic conditions These soils show a moderate wetness limitation which can restrict plant and root development and may increase the likelihood of soil structural damage through trafficking by agricultural machinery or poaching by grazing livestock

Subgrade 3b

5 3 The majority of the agricultural land on the site has been classified as Subgrade 3b due to a significant soil wetness limitation Soil profiles were found to comprise medium clay loam topsoils overlying clay subsoils occasionally with heavy clay loam upper subsoils Topsoils tend to be very slightly stony (2-3% total soft sandstone) upper subsoils slightly stony (5 10% total soft sandstone) with clay subsoils being variably stony containing between 5-15% total soft sandstone Profiles show evidence of imperfect drainage in the form of gleying throughout the topsoils and subsoils A subsequent soil inspection pit found the clay lower subsoil to be poorly structured with low porosity from 35cm therefore it is classified as a slowly permeable layer which will significantly impede soil drainage Furthermore the clay lower subsoil was found to be interbedded with 15% total soft sandstone to a depth of 50cm The presence of gleying and the shallow depth to the slowly permeable layer means that these soils are assigned to Wetness Class IV with a resultant classification of Subgrade 3b given the prevailing climatic conditions Poorly

drained wet soils can inhibit plant and root development and may be more susceptible to structural damage through trafficking by agricultural machinery or poaching by grazing livestock

ADAS Ref 4205/28/95
MAFF Ref EL 42/130

Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1972) Sheet No 302 Horsham 1 50 000 Series (solid and drift edition)

MAFF (1988) Agricultural Land Classification of England and Wales Revised guidelines and criteria for grading the quality of agricultural land

Meteorological Office (1989) Climatological Data for Agricultural Land Classification

Soil Survey of England and Wales (1983) Sheet 6 Soils of South East England 1 250 000 and accompanying legend

APPENDIX I

DESCRIPTION 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 (eg 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

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 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 (eg polythene tunnels erected for lambing) may be ignored

Open Water

Includes lakes ponds and rivers as map scale permits

Land Not Surveyed

Agricultural land which has not been surveyed

Where the land use includes more than one of the above eg buildings in large grounds and where map scale permits the cover types may be shown separately Otherwise the most extensive cover type will be shown

APPENDIX II

FIELD ASSESSMENT OF SOIL WETNESS CLASS

SOIL WETNESS CLASSIFICATION

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

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 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

Soils can be allocated to a wetness class on the basis of quantitative data recorded over a period of many years or by the interpretation of soil profile characteristics site and climatic factors Adequate quantitative data will rarely be available for ALC surveys and therefore the interpretative method of field assessment is used to identify soil wetness class in the field The method adopted here is common to ADAS and the SSLRC

[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 III

SOIL PIT AND SOIL BORING DESCRIPTIONS

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	**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 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 HORSHAM DLP TOWER HILL Pit Number 1P

Grid Reference TQ16102910 Average Annual Rainfall 802 mm
Accumulated Temperature 1458 degree days
Field Capacity Level 167 days
Land Use Permanent Grass
Slope and Aspect degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 26	MCL	10YR52 00	0	2	MSST	C				
26- 35	HCL	10YR52 00	0	5	MSST	C	MDCSAB	FR	M	
35 50	C	10YR63 00	0	15	MSST	C	WKCSAB	FM	P	
50- 75	C	10YR62 00	0	0		C	WKCSAB	FM	P	

Wetness Grade 3B Wetness Class IV
Gleying 0 cm
SPL 035 cm

Drought Grade APW mm MBW 0 mm
APP mm MBP 0 mm

FINAL ALC GRADE 3B
MAIN LIMITATION Wetness

SAMPLE NO	GRID REF	USE	ASPECT	GRDNT	GLEY	SPL	WETNESS- CLASS	WHEAT- GRADE	-POTS AP	-POTS MB	M REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1	TQ16062926	PGR		0	035	4	3B		0	0					WE	3B	
1P	TQ16102910	PGR		0	035	4	3B		0	0					WE	3B	
2	TQ16302930	PGR		0	022	4	3B		0	0					WE	3B	
3	TQ15902920	PGR		20	050	3	3A		0	0					WE	3A	
4	TQ15982918	PGR		0	050	3	3A		0	0					WE	3A	
5	TQ16052917	PGR		0	038	4	3B		0	0					WE	3B	
6	TQ16162922	PGR		0	023	4	3B		0	0					WE	3B	
7	TQ16262921	PGR		0	035	4	3B		0	0					WE	3B	
8	TQ16022922	PGR		0	022	4	3B		0	0					WE	3B	
9	TQ16102910	PGR		0	020	4	3B		0	0					WE	3B	
10	TQ16202910	PGR		0	022	4	3B		0	0					WE	3B	

SAMPLE	DEPTH	TEXTURE	COLOUR	-MOTTLES COL	ABUN	CONT	PED COL	GLEY	----STONES 2	6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC
1	0-24	mcl	10YR42 00	10YR58 00	C			Y	0	0		0						
	24-35	hcl	10YR52 00	10YR58 00	C			Y	0	0	MSST	10		M				
	35-65	c	10YR62 00	10YR68 71	M			Y	0	0	MSST	5		P				Y
1P	0-26	mcl	10YR52 00	10YR56 00	C		00MN00 00	Y	0	0	MSST	2						
	26 35	hcl	10YR52 00	10YR58 61	C		00MN00 00	Y	0	0	MSST	5	MDCSAB FR	M				
	35 50	c	10YR63 00	10YR68 72	C			Y	0	0	MSST	15	WKCSAB FM	P	Y			Y
	50-75	c	10YR62 00	10YR68 71	C			Y	0	0		0	WKCSAB FM	P				Y
2	0 22	hzcl	10YR53 00	10YR58 61	C			Y	0	0	HR	2						
	22 60	c	10YR62 00	10YR68 71	C			Y	0	0	HR	10		P				Y
3	0 20	mcl	10YR43 00						0	0	MSST	2						
	20 35	mcl	10YR43 00	10YR56 00	C			Y	0	0	MSST	5		M				
	35 50	mcl	10YR52 00	10YR58 00	C			Y	0	0	MSST	10		M				
	50-75	c	10YR62 63	10YR68 71	M			Y	0	0	MSST	5		P				Y
4	0 21	mcl	10YR53 00	10YR56 00	C			Y	0	0	MSST	2						
	21 30	mcl	10YR52 00	10YR58 00	C			Y	0	0	MSST	5		M				
	30 50	hcl	10YR62 00	10YR68 00	C			Y	0	0	MSST	20		M				
	50 70	c	10YR62 63	10YR68 71	C		00MN00 00	Y	0	0	MSST	5		P				Y
5	0-25	mcl	10YR52 00	10YR58 00	C			Y	0	0	MSST	2						
	25-38	hcl	10YR62 00	10YR68 00	C			Y	0	0	MSST	5		M				
	38-65	c	10YR62 63	10YR68 72	M		00MN00 00	Y	0	0	MSST	5		P				Y
6	0-23	mcl	10YR43 00	10YR58 00	C			Y	0	0		0						
	23-65	c	10YR62 00	10YR68 71	M		00MN00 00	Y	0	0	MSST	5		P				Y
7	0-20	hcl	25Y 53 00	25Y 68 72	C			Y	0	0	MSST	3						
	20-35	hcl	10YR62 00	10YR68 00	C			Y	0	0	MSST	10		M				
	35-65	c	10YR62 63	10YR68 71	C			Y	0	0	MSST	10		P				Y
8	0 22	mcl	10YR52 00	10YR58 00	C			Y	0	0		0						
	22 65	c	10YR62 00	10YR68 71	C		00MN00 00	Y	0	0	MSST	5		P				Y
9	0 20	mcl	10YR62 00	10YR68 71	C			Y	0	0	MSST	2						
	20-60	c	10YR62 00	10YR68 71	M			Y	0	0	MSST	15		P				Y
	60-80	c	10YR63 00	10YR68 71	C			Y	0	0		0		P				Y
10	0-22	mcl	10YR53 00	10YR58 00	C			Y	0	0	MSST	3						
	22-45	c	10YR52 00	10YR68 71	C			Y	0	0	MSST	15		P				Y
	45-70	c	10YR62 00	10YR68 71	M			Y	0	0		0		P				Y