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Wates Developments Limited

Land at Crawley Down, West Sussex

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1 Introduction

- 1.1 Reading Agricultural Consultants Ltd (RAC) is instructed by Wates Developments Ltd to investigate the Agricultural Land Classification (ALC) and soil resources of land west of Crawley Down, West Sussex by means of a detailed survey of soil and site characteristics.
- 1.2 Guidance for assessing the quality of agricultural land in England and Wales is set out in the Ministry of Agriculture, Fisheries and Food (MAFF) revised guidelines and criteria for grading the quality of agricultural land¹, and summarised in Natural England's Technical Information Note (TIN) 049².
- 1.3 Agricultural land in England and Wales is graded between 1 and 5, depending on the extent to which physical or chemical characteristics impose long-term limitations on agricultural use. The principal physical factors influencing grading are climate, site conditions and soil which, together with interactions between them, form the basis for classifying land into one of the five grades.
- 1.4 Grade 1 land is excellent quality agricultural land with very minor or no limitations to agricultural use. Grade 2 is very good quality agricultural land, with minor limitations which affect crop yield, cultivations or harvesting. Grade 3 land has moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield, and is subdivided into Subgrade 3a (good quality land) and Subgrade 3b (moderate quality land). Grade 4 land is poor quality agricultural land with severe limitations which significantly restrict the range of crops and/or level of yields. Grade 5 is very poor quality land, with very severe limitations which restrict use to permanent pasture or rough grazing.
- 1.5 Land which is classified as Grades 1, 2 and 3a in the ALC system is defined as best and most versatile (BMV) agricultural land.
- 1.6 As explained in Natural England's TIN049, the whole of England and Wales was mapped from reconnaissance field surveys in the late 1960s and early 1970s, to provide general strategic guidance on agricultural land quality for planners. This Provisional Series of maps was published

¹ **MAFF (1988)**. *Agricultural Land Classification of England and Wales. Revised guidelines and criteria for grading the quality of agricultural land.*

² **Natural England (2012)**. *Technical Information Note 049 - Agricultural Land Classification: protecting the best and most versatile agricultural land*, Second Edition.

on an Ordnance Survey base at a scale of One Inch to One Mile (1:63,360). The Provisional ALC map shows the site as Grade 3. However, TIN049 explains that:

"These maps are not sufficiently accurate for use in assessment of individual fields or development sites, and should not be used other than as general guidance. They show only five grades: their preparation preceded the subdivision of Grade 3 and the refinement of criteria, which occurred after 1976. They have not been updated and are out of print. A 1:250 000 scale map series based on the same information is available. These are more appropriate for the strategic use originally intended ..."

- 1.7 TIN049 goes on to explain that a definitive ALC grading should be obtained by undertaking a detailed survey according to the published guidelines, at an observation density of one boring per hectare. This survey follows the detailed methodology set out in the ALC guidelines.

2 Site and climatic conditions

General features, land form and drainage

- 2.1 The site extends to approximately 31 hectares (ha) of permanent grassland used for sheep grazing (formerly grazed by dairy cattle). The land comprises several fields north and south of Huntsland Lane, bounded on the south by a disused railway which is now a cycle path. The site is surrounded mostly by woodland.
- 2.2 A brook runs east to west across the site. North of this the land rises with moderate slope (4-7°) to a plateau north of Huntsland Lane. South of the brook the land comprises a plateau on the south-east with gentle (2-4°) slopes to the north-west and south-west. Slope was measured by clinometer and does not exceed 7° and so is not limiting to agricultural land quality. Altitudes range from 100 m to 127 m above Ordnance Datum (AOD).

Agro-climatic conditions

- 2.3 Agro-climatic data for the site have been interpolated from the Meteorological Office's standard 5km grid point data set at representative altitude of 115 m AOD. This is given in Table 1. The rainfall is substantially above average for lowland England and accumulated temperatures are warm with slight moisture deficits. The number of Field Capacity Days is below average for lowland England with reduced opportunities for agricultural field work. There is however no overriding climatic limitation to agricultural land quality.

Table 1: Local agro-climatic conditions

Parameter	Value
Grid Reference	533800 137300
Average Annual Rainfall	841 mm
Accumulated Temperatures >0°C	1,388 day°
Field Capacity Days	176 days
Average Moisture Deficit, wheat	95 mm
Average Moisture Deficit, potatoes	84 mm

Soil parent material and soil type

- 2.4 The bedrock geology is mapped by the British Geological Survey³ as Tunbridge Wells Sand which comprises thinly bedded silty mudstones, siltstones and silty sandstones with fine sandstones exposed on the scarps. A narrow band of mudstone is marked in the south.
- 2.5 No superficial deposits are indicated although the survey identified Colluvium in some footslopes.
- 2.6 The Soil Survey of England and Wales soil association mapping⁴ (1:250,000 scale) indicates the plateau as Curtisden association, which comprises silty soils over siltstone with slowly permeable subsoils and slight seasonal waterlogging. The association also includes some similar well-drained soils. Wetness Class (WC) is typically imperfectly to poorly drained (III – IV) but can be improved to moderately well drained WC II by underdrainage⁴.

³ **British Geological Survey (2024)**. *BGS Geology Viewer*, <https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/>

⁴ **Soil Survey of England and Wales (1984)**. *Soils of South East England (1:250,000)*, Sheet 6, Bulletin 15.

3 Agricultural land quality

Soil survey methods

- 3.1 In total, 37 soil profiles were examined by augers. Observation density was at least one per hectare in accordance with the established recommendations for ALC surveys². Two pits were also excavated to 50-65 cm depth to examine soil structures. At each observation point the following characteristics were assessed for each soil horizon up to 120 cm or impenetrable layer:
- soil texture;
 - significant stoniness;
 - colour (including localised mottling);
 - consistency;
 - structural condition;
 - free carbonate; and
 - depth.
- 3.2 Two topsoil samples were submitted for laboratory determination of particle size distribution, and pH, organic matter content and nutrient contents (P, K, Mg). Results are contained in Appendix 1.
- 3.3 Soil Wetness Class (WC) was determined from the matrix colour, presence or absence of, and depth to, greyish and ochreous gley mottling, and slowly permeable subsoil layers at least 15cm thick, in relation to the number of Field Capacity Days at the location.
- 3.4 Soil droughtiness was investigated by the calculation of moisture balance equations (given in Appendix 2). Crop-adjusted Available Profile Water (AP) is estimated from texture, stoniness and depth, and then compared to a calculated moisture deficit (MD) for the standard crops wheat and potatoes. The MD is a function of potential evapotranspiration and rainfall. Grading of the land can be affected if the AP is insufficient to balance the MD and droughtiness occurs.
- 3.5 Assessment of agricultural land quality has been carried out according to the revised ALC guidelines¹. Soil profiles have been described according to Hodgson⁵ which is the recognised source for describing soil profiles and characteristics according to the revised ALC guidelines.

⁵ Hodgson, J. M. (Ed.) (1997). *Soil survey field handbook*. Soil Survey Technical Monograph No. 5, Silsoe.

Soil types and agricultural land quality

3.6 There are three main soil types within the site, shown in Figure 1 below and comprising:

- light silty soil over sandstone;
- medium silty soils over siltstone; and
- medium silty soils over silty mudstone.

Figure 1: Soil Types



3.7 Generic descriptions of the three main soil types are given below. All profiles are non-droughty and the ALC grade is determined by soil wetness. For grading purposes very fine sandy silt loam, silty loam and medium silty clay loam topsoils are similar and ALC grade varies from 1, 2, 3a or 3b according to whether the Wetness Class is I, II, III or IV respectively.

3.8 Wetness Class is determined by the presence or absence of mottling in the top 40cm and by depth to a slowly permeable compact layer (unaugerable siltstone is assumed to be impermeable).

Depth (cm)	Light silty soils over Siltstone (J1)
0-30 cm	Dark greyish brown or brown (10YR4/2-4/3) fine sandy silt loam. Friable, small rounded crumbs in top 5-10 cm. 10-25cm layer has subangular blocky structure. Fine roots are common throughout; a layer of buried stones can occur at 25-30cm.
30- 45 cm-	Brownish yellow (10YR6/6) to pale yellow (2.5Y7/4) fine sandy silt loam or silty clay loam. Variably mottled. Apedal, loose with little cohesion and some rooting. About 5% stones.
45 cm-	Pale yellow (5Y8/2) or grey sandy silt loam or silty clay loam with many iron mottles. Slightly stony.
65/80 cm-	Unaugerable dense or stony Siltstone or fine Sandstone (at greater depth in locations 13-15)

3.9 These soils are well or moderately well drained in WC I or II (Grade 1 or 2), although are WC III (Subgrade 3a) where the springlines occur on scarp edges.

Depth (cm)	Medium silty soils over Siltstone (J2)
0-30 cm	Brown (10YR4/3-5/3) medium silty clay loam. Non-calcareous
30- 60 cm	Brownish yellow (10YR6/6) to pale yellow (2.5Y7/4) medium silty clay loam. Variably mottled.
50/65 cm-	Pale yellow (5Y8/2) with many iron mottles – variable texture silt to heavy silty clay loam. Stoneless or Slightly stony.
70/100 cm-	Unaugerable dense or stony Siltstone

3.10 These soils are WC II or III, and classified as mostly Grade 2 and Subgrade 3a.

Depth (cm)	Medium silty soils over Silty Mudstone (G2)
0-30 cm	Brown (10YR4/3) to dark greyish brown (10YR5/2) medium silty clay loam. Non-calcareous. Granular in top 10cm, fine subangular blocky beneath with roots throughout.
30- 60 cm	Brownish yellow (10YR6/6) to light yellowish brown (10YR6/4) heavy clay loam or silty clay. Variably mottled. Poorly to moderately developed firm angular blocky structures.
50/65 cm-	Light brownish grey (2.5Y6/2) silty clay with brownish yellow (10YR6/8) and yellowish red (5YR7/8) common fine mottles. 5% grit stones, coarse very firm subangular blocky structure.
80/100 cm-	Mudstone or Siltstone

3.11 These soils are poorly drained in WC IV, locally III, and classified as mostly Subgrade 3b. Much of the Subgrade 3b land is on clayey strata, on springlines or in depressions with rush areas where drainage conditions cannot be improved.

3.12 On the footslopes and valleys, deeper colluviated soils overlie siltstone at between 80 and 120 cm depth. Wetness Class also varies from I to IV where groundwater flows are influential.

3.13 On the south-eastern plateau, the soils are enriched in organic matter to about 40cm depth overlying mottled subsoils passing to siltstone (WC III).

3.14 The distribution of ALC at the site is shown in Figure RAC/10519/2 and Table 2.

Table 2: ALC area

Grade	Description	Area (ha)	%
Grade 1	Excellent quality	1.3	4
Grade 2	Very good quality	5.4	17
Subgrade 3a	Good quality	15.5	50
Subgrade 3b	Moderate quality	7.6	24
Non-agricultural		1.6	5
Total			100

Appendix 1: Laboratory Data

Determinand	A 0-25cm	B 0-25cm	Units
Coarse Sand 2-0.6 mm	5		% w/w
Medium Sand 0.6-0.2 mm	6		% w/w
Fine Sand 0.2-0.1 mm	4		% w/w
V fine Sand 0.1-0.063 mm	11		20
Silt 0.063-0.002 mm	60	62	% w/w
Clay <0.002 mm	14	18	% w/w
Organic Matter	3.4	3.4	% w/w
Total Nitrogen	0.21	0.20	% w/w
Calcium Carbonate	< 1		% w/w
Texture	fine sandy silt loam *	medium silty clay loam, silty loam, sandy silt loam, medium clay loam	

Determinand	A 0-25cm	B 0-25cm	Units
Soil pH	6.4	5.8	
Phosphorus (P)	48	14	mg/l (av)
Potassium (K)	81	34	mg/l (av)
Magnesium (Mg)	69	65	mg/l (av)

Determinand	A 0-25cm	B 0-25cm	Units
Phosphorus (P)	4	1	ADAS Index
Potassium (K)	1	0	ADAS Index
Magnesium (Mg)	2	2	ADAS Index
Organic Matter (SOM)	moderate		SSEW ⁴

* because 85% of the soil is finer than 0.1 mm should be treated as a silt loam for wetness grading purposes.

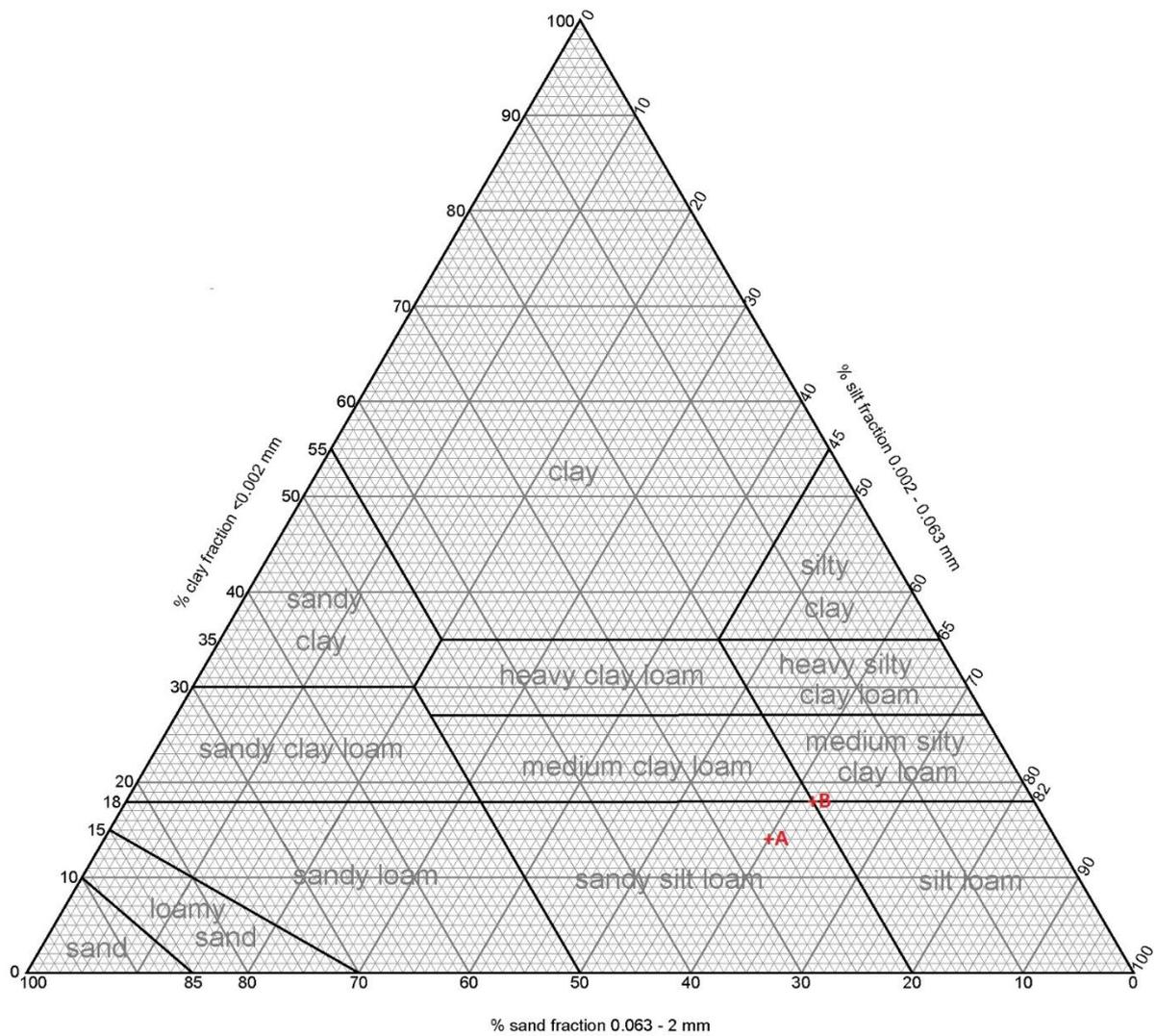
Samples are composites of 15-20 cores taken to 25cm depth.

Particle size by Pipette method, Carbon by Skalar machine.

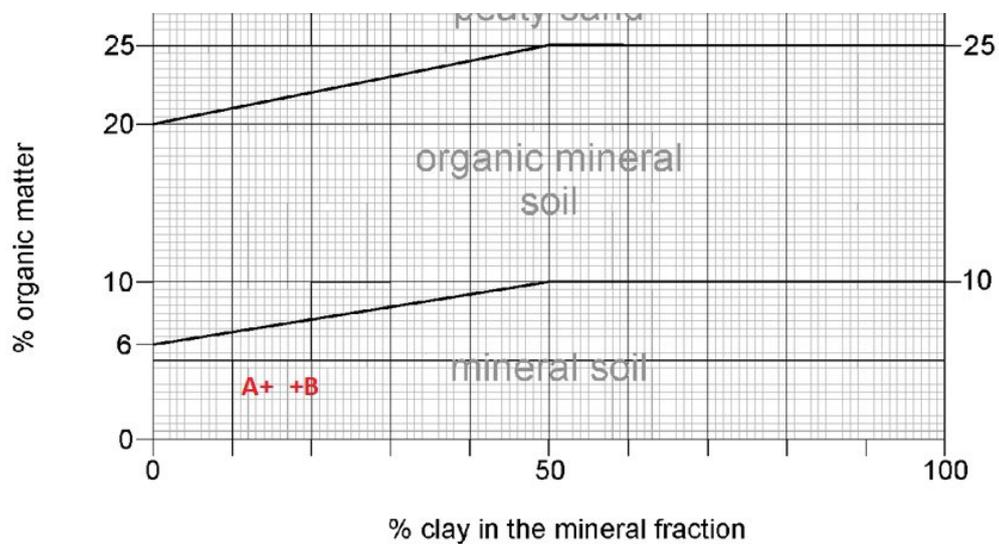
Organic Matter = Total Organic Carbon /0.58. Reported on 30°C dry sample basis

Samples taken around pits (0-25cm) indicate high (4) to low (1) soil phosphorus and low (0 – 1) potassium levels, moderate magnesium and slightly acid pH. Topsoil is well structured and organic matter levels (3.4%) are good in view of clay content.

Soil Texture by Particle Size Analysis



Organic Matter Class



Appendix 2: Soil Profile Summaries and Droughtiness Calculations

Unaugerable siltstone assumed to contain 8% available water and 5% easily available. For Curtisdens series (imperfectly drained) Soil survey memoirs⁴ cite typical AP values of 155 wheat & 135 mm potatoes; Cranbrook (groundwater-affected) 155 & 110 mm; Stanway (slowly permeable) 135 & 115 mm

Wetness / workability limitations are determined according to the methodology given in Appendix 3 of the ALC guidelines, MAFF 1988

Droughtiness calculations are made according to the methodology given in Appendix 4 of the ALC guidelines, MAFF 1988.

Grades are shown for drought, wetness and any other soil or site factors which are relevant. The overall Grade is set by the most limiting factor and shown on the right.

Stone types			Climate Data		Wetness Class Guidelines					Climate	
%	TA _v	EA _v	MDwheat	95	SPL within 80cm, gleying within 40cm	<i>II</i>	<i>III</i>	<i>IV</i>	<i>V</i>	1,388 D° Limitation Grade 1	
siltstn	8	5	MDpotato	84	SPL within 80cm, gleying at 40-70cm	>75cm	48-75cm	<48cm			
			FCD	176	No SPL but gleying within 40cm	>63cm	<63cm	coarse subsoil	<i>I</i>		other cases

ZSt = dense / hard Siltstone AAR 841 Maximum depth of auger penetration is underlined 120m

Site No.	Depth cm	Texture	CaCO ₃	Colour	Mottle colour	abund- ance	stone% siltstn	stone%	Struct- ure	APwhea t mm	AP potato mm	Gley	SPL	WC	Wetness grade WE	Final Grade	Limiting Factor(s)
1	0	38	mCL	10YR4/3	Fe	com			-	61	61	n	n	<i>III</i>	3a	3a	WE
	38	60	mCL	10YR5/4	Fe	com				29	35	(y)	n				
	60	80	ZC	10YR7/6	grey	many			poor	14	12	(y)	y				
	60	85	mCL						poor	18	0	n	y				
	<u>85</u>	120	ZSt							18	0	n	y				
									Total	139	108						Grass (no clover)
									MB	44	24						
									Droughtiness grade (DR)		1	1					
2	0	23	mZCL	10YR4/2					-	39	39	n	n	<i>IV</i>	3b	3b	WE
	23	40	mZCL	5Y8/2	Fe	very				29	29	y	n				
	40	50	ZL	5Y8/2	Fe	very			poor	15	15	y	y				
	40	70	mZCL	5Y8/2	Fe	many			poor	24	36	y	y				
	<u>70</u>	120	ZSt							25	0	n	y				
									Total	132	119						Grass (no clover). Rushes
									MB	37	35						
									Droughtiness grade (DR)		1	1					
3	T	0	32	mZCL	10YR4/3		0		-	61	61	n	n	<i>III</i>	3a	3a	WE
		32	50	mZCL	2.5Y7/3	MnFe	com	0	m/poor	26	26	y	n				
		50	97	ZCL	10Y8/2	Fe	com	0	m/poor	38	29	y	(y)				

		<u>97</u>	120	ZSt						12	0	n	y				
									Total	136	116			GR.gradient	1o	N	
									MB	41	32			Mottled from 25cm	Grass (no clover)		
									Droughtiness grade (DR)		1	1					
4	T	0	30	mZCL	10YR4/3			2	-	56	56	n	n	///	3a	3a	WE
		30	40	mZCL	10YR5/3	Mn	com	2		17	17	y	n				
		40	60	ZL	10YR7/3	Fe	com	2		36	43	y	n				
		60	82	ZL	10YR6/8	grey	pred	10		29	21	(y)	(y)				
		<u>82</u>	120	ZSt						19	0	n	y				
									Total	157	137			Grass ley (no clover)			
									MB	62	53						
									Droughtiness grade (DR)		1	1					
5		0	35	fSZL	10YR4/3				-	74	74	n	n	///	3a	3a	WE
		35	50	fSZL	10YR5/8	Fe	com			32	32	(y)	n				
		50	60	fSZL	2.5Y7/3	Fe	com			15	21	y	n				
		60	75	ZL	2.5Y7/3	Fe	many		poor	14	15	y	y				
		<u>75</u>	120	ZSt						23	0	n	y				
									Total	156	141			Grass ley (no clover)			
									MB	61	57						
									Droughtiness grade (DR)		1	1					
6	T	0	29	fSZL	10YR4/3			4	-	62	62	n	n	///	3a	3a	WE
		29	45	fSZL	2.5Y7/4	Fe	com	8		32	32	y	n				
		45	75	ZL	10YR7/3	Fe	com	5		45	53	y	n				
		<u>75</u>	120	Zst						23	0	n	y				
									Total	161	147			Grass ley (no clover)			
									MB	66	63						
									Droughtiness grade (DR)		1	1					
7	T	0	35	mZCL	10YR4/3			2	-	66	66	n	n	I-II	3a	3a	WE
		35	80	fSZL	10YR6/6	Fe	com	2		76	73	(y)	n				
		<u>80</u>	120	Zst						20	0	n	y				
									Total	161	138			Grass ley (no clover)			
									MB	161	138						

														Droughtiness grade (DR)		1	1						
8	T	0	30	fSZL	10YR4/3				2	-	65	65	n	n	//	2	2	WE					
		30	40	fSZL	10YR5/3	OM				2		21	21	n	n								
		40	70	SZL	5Y8/2	FeMn	com		10		37	48	y	n									
		70	82	mZCL	2.5Y7/2	Fe	many		0	poor	7	0	y	y									
		<u>82</u>	120	ZSt							19	0	n	y									
												Total	149	134					GR.gradient				
										MB	54	50					Grass ley (no clover)	3o	W				
														Colluvium		Droughtiness grade (DR)		1	1				
9	T	0	28	fSZL	10YR4/3				8	-	58	58	n	n	//	2	2	WE					
		28	40	fSZL	10YR5/3				20		22	22	n	n									
		40	75	ZL	5Y8/2	Fe	com		5		55	64	y	n									
		<u>75</u>	120	Zst							23	0	n	y									
												Total	158	144					Grass ley (no clover)				
										MB	63	60											
														Droughtiness grade (DR)		1	1						
pit A		0	25	fSZL	10YR4/2				5	-	51	51	n	n	/	1	2	DR					
		25	30	SZL	10YR5/4				50		6	6	n	n									
		30	50	SZL	10YR5/4				5		33	33	n	n									
		<u>50</u>	120	fSst							21	10	n	n									
												Total	111	100					Grass ley (no clover)				
										MB	16	16											
														Droughtiness grade (DR)		2	1						
10	T	0	30	fSZL	10YR5/3				4	-	64	64	n	n	///	3a	3a	WE					
		30	43	ZCL	10YR6/8	OMFe	com		4		22	22	(y)	n									
		43	65	mZCL	5Y8/2	Fe	com		4		26	37	y	n									
		<u>65</u>	120	Zst							28	4	n	y									
												Total	140	127					Grass ley (no clover)				
										MB	45	43											
														Droughtiness grade (DR)		1	1						
11		0	33	mZCL	10YR4/3				2	-	56	56	n	n	///	3a	3a	WE					
		33	60	fSZL	10YR6/6				2		50	56	n	n									

	60	80	fSZL	10YR7/4	Fe	many	2	poor	18	15	y	y				
	<u>80</u>	120	ZSt						20	0	n	y				
								Total	143	126			GR.gradient	4 o	SE	
								MB	143	126			Grass ley (no clover)			
								Droughtiness grade (DR)	1	1						
12	0	30	fSZL	10YR4/3				-	63	63	n	n	<i>I-II</i>	2	2	WE
	30	35	fSZL	10YR4/3			5		10	10	n	n				
	35	45	SZL	10YR7/6	Fe	com	10		16	16	(y)	n				
	45	70	SZL	10YR8/3	Fe	many	10		29	40	y	n				
	<u>70</u>	120	fSst						15	0	n	n				
								Total	133	130			GR.gradient	4o	SE	
								MB	38	46			Grass ley (no clover)			
								Droughtiness grade (DR)	1	1						
13	0	30	fSZL	10YR4/3				-	63	63	n	n	<i>I</i>	1	1	none
	30	44	fSZL	10YR5/2					29	29	n	n				
	44	55	fSZL	10YR6/8					20	23	n	n				
	55	60	ZL	10YR6/8	Fe	com	5		7	11	(y)	n				
	60	90	SZL	10YR5/8			5		32	17	n	n				
	<u>90</u>	120	fSst						9	0	n	n				
								Total	161	143			Grass ley (no clover)			
								MB	66	59						
								Droughtiness grade (DR)	1	1						
14	0	40	fSZL	10YR4/4				-	84	84	n	n	<i>I</i>	1	1	none
	40	50	fSZL	10YR4/4	OM	com			21	21	n	n				
	50	75	fSZL	10YR4/4					38	42	n	n				
	75	85	fSZL	10YR5/6					15	0	n	n				
	<u>85</u>	120	ZSt						18	0	n	y				
								Total	175	147			Grass ley (no clover)			
								MB	80	63						
								Droughtiness grade (DR)	1	1						
15	T	0	32	fSZL	10YR5/3		4	-	69	69	n	n	<i>I-II</i>	2	2	WE
		32	40	ZL	10YR6/3		2		17	17	n	n				
		40	60	ZL	10YR5/8 &5/3	Fe	com	2		36	43	y	n			
		60	80	ZL	10YR7/8	Fe	com	10	m/poor	1	17	(y)	n			

		<u>80</u>	120	ZSt						20	0	n	y				
									Total	143	146			Grass ley (no clover)			
									MB	48	62						
									Droughtiness grade (DR)			1	1				
16		0	30	mZCL	10YR4/3				-	51	51	n	n	///	3a	3a	WE
		30	55	mZCL	10YR5/4	10YR6/8	many			39	43	(y)	n				
		55	70	hZCL	10YR5/4	10YR6/8	pred		poor	9	18	(y)	y				
		70	80	fSZL	10YR6/6					15	0	n	n				
		<u>80</u>	120	Zst						20	0	n	y				
									Total	134	112			GR.gradient Grass (no clover)			
									MB	39	28					3 o	S
									Droughtiness grade (DR)			1	1				
17	T	0	27	mZCL	10YR4/3			2	-	51	51	n	n	/	2	2	WE
		27	32	mZCL				10		8	8	n	n				
		32	75	mZCL	10YR5/6	OM		2		55	64	n	n				
		75	90	mZCL	5Y8/2	Fe	many	2	m/poor	12	0	y	n				
		<u>90</u>	120	ZSt						15	0	n	y				
									Total	141	123			GR.gradient Grass (no clover)			
									MB	46	39					4o	S
									Droughtiness grade (DR)			1	1				
18	T	0	27	ZL	10YR4/3			2	-	61	61	n	n	//	3a	3a	WE
		27	40	ZL/ZCL	10YR6/3	Fe	com	2		25	24	y	n				
		40	55	mZCL	5Y8/2	FeMn	com	2	m/poor	18	22	y	n				
		55	78	SZL	2.5Y7/3	Fe	many	10		24	24	y	n				
		<u>78</u>	120	ZSt						21	0	n	y				
									Total	150	131			GR.gradient Grass (no clover)			
									MB	55	47					5o	S
									Droughtiness grade (DR)			1	1				
19	T	0	25	mZCL	10YR4/3	Fe	few	4	-	46	46	n	n	/V	3b	3b	WE GW
		25	42	ZL	2.5Y6/2	Fe	many	10		35	35	y	n				
		42	65	mZCL	2.5Y6/3	FeMn	many	2	m/poor	23	33	y	(y)				
		65	120	fSZL	10GY8/1	Fe	many	2	poor	49	7	y	y				

											GR.gradient			3o	S		
											Grass (no clover)						
											Total	154	122				
											MB	59	38				
											Droughtiness grade (DR)		1	1			
20	0	30	mZCL	10YR5/4			0	-	51	51	n	n	IV	3b	3b	WE	
	30	80	hZCL	10YR6/4	Fe	many	0	poor	42	48	y	y					
	<u>80</u>	120	ZSt						20	0	n	y					
											Total	113	99				
											MB	18	15				
											Droughtiness grade (DR)		2	1			
21	0	30	mZCL	10YR4/3				-	51	51	n	n	III	3a	3a	WE	
	30	55	hZCL	10YR6/4	Fe	many		m/poor	33	36	y	n					
	55	75	ZL	10YR5/3	Fe	pred			28	33	y	n					
	<u>75</u>	120	ZSt						23	0	n	y					
											Total	134	120				
											MB	39	36				
											Droughtiness grade (DR)		1	1			
22	T	0	29	mZCL	10YR5/3				-	55	55	n	n	II	3a	3a	WE
		29	40	mZCL	10YR5/4	OM				19	19	n	n				
		40	50	mZCL	10YR6/6					17	17	n	n				
		50	65	fSZL						21	30	n	n				
		65	90	ZL	5Y8/2	Fe	many	2	m/poor	0	9	y	(y)				
		90	100	hZCL	5Y7/2	Fe	many	0	poor	6	0	y	y				
		<u>100</u>	120	ZSt						10	0	n	y				
											Total	128	129				
											MB	33	45				
											Droughtiness grade (DR)		1	1			
23	T	0	29	mZCL	10YR5/3				-	55	55	n	n	I	2	2	WE
		29	45	mZCL	10YR5/4	OM				27	27	n	n				
		45	80	mZCL	10YR6/6	Fe	few	2	m/poor	31	36	n	n				
		80	100	mZCL	5Y8/2	Fe	com	2	m/poor	16	0	y	(y)				
		<u>100</u>	120	ZSt						10	0	n	y				
											Total	139	118				
											Droughtiness grade (DR)		1	1			
											GR.gradient		2o	N			
											Grass (no clover)						

									MB	44	34							Grass (no clover)
									Droughtiness grade (DR)		1	1						
24	T	0	28	ZL	10YR4/3			2	-	64	64	n	n	//	3a	3a	WE	
		28	65	mZCL	10YR5/6	OM		2		52	62	n	n					
		65	88	mZCL	2.5Y7/2	Fe	com	2	m/poor	18	7	y	(y)					
		<u>88</u>	120	ZSt						16	0	n	y					
										Total	150	133					GR.gradient	2o
										MB	55	49					Rough grass	
									Droughtiness grade (DR)		1	1						
25	T	0	27	mZCL	10YR5/2	Fe	few	0	-	51	51	n	n	IV	3b	3b	WE GW	
		27	70	mZCL	10GY7/2	Fe	many	2	poor	58	72	y	y					
		70	100	ZL	10GY8/1	Fe	many	2	poor	27	0	y	y					
		<u>100</u>	120	ZSt						10	0	n	y					
										Total	147	124					GR.gradient	2o S
										MB	52	40					Rough grass and weed	
									Droughtiness grade (DR)		1	1						
26		0	20	fSZL	10YR5/3				-	42	42	n	n	IV	3b	3b	WE GW	
		20	60	hCL	2.5YR8/2	Fe	many		m/poor	51	56	y	y					
		60	80	mZCL	2.5YR8/2	Fe	very			20	17	y	n					
		<u>80</u>	120	Zst						20	0	n	y					
										Total	132	115					GR.gradient	3 o SW
										MB	37	31					Rough grass with some rush	
									Droughtiness grade (DR)		1	1						
27	T	0	25	mZCL	10YR5/3			2	-	47	47	n	n	//	3a	3a	WE	
		25	50	mZCL	10YR6/3	MnFe	com	2		42	42	y	n					
		50	100	mZCL	2.5Y7/3	OMFe		2	m/poor	40	29	y	n					
		<u>100</u>	120	ZSt						10	0	n	y					
										Total	139	118					GR.gradient	2o
										MB	44	34					Rough grass	
									Droughtiness grade (DR)		1	1						
28		0	38	hCL	10YR4/3			2	-	60	60	n	n	///	3b	3b	WE	
		38	70	hCL	10YR6/4	Fe	many	2		39	51	y	n					
		70	90	hCL	2.5Y6/2	Fe	very	2	poor	14	0	y	y					

		<u>90</u>	120	Mst					poor	15	0	n	y					
									Total	128	111			GR.gradient		3o	SW	
									MB	33	27			Grass (no clover)				
									Droughtiness grade (DR)		1	1						
29		0	37	mZCL	10YR4/2				-	63	63	n	n	///	3a	3a	WE	
		37	60	hCL	10YR5/6					31	37	n	n					
		60	80	C	10YR6/4	Fe	many		poor	14	13	y	y					
		<u>80</u>	120	Mst					poor	20	0	n	y					
									Total	128	113			GR.gradient		4o	SW	
									MB	33	29			Grass (no clover)				
									Droughtiness grade (DR)		1	1						
30		0	35	mZCL	10YR5/3				-	60	60	n	n	///	3b	3b	WE	
		35	40	ZC	10YR5/3	Fe	com			8	8	y	n					
		40	50	ZC	10YR6/4	Fe	many		poor	12	12	y	y					
		50	60	ZC	2.5Y7/4	red	pred		poor	7	12	y	y					
		50	105	C	2.5Y7/2	red	pred		poor	39	26	y	y					
		<u>105</u>	120	Mst					poor	8	0	n	y					
									Total	132	117			GR.gradient		4 o	NE	
									MB	37	33			Grass (no clover), wet patches				
									Droughtiness grade (DR)		1	1						
pit B		0	32	mZCL	10YR5/2	Fe	com		-	54	54	y	n	///	3b	3b	WE	
		32	50	hCL	10YR5/6	Fe	very		m/poor	25	25	(y)	(y)					
		50	65	ZC	2.5Y6/2	red	many	5	poor	10	18	y	y					
		<u>65</u>	120	Zst						28	4	n	y					
									Total	117	101			GR.gradient		1 o	SW	
									MB	22	17			Grass (no clover)				
									Droughtiness grade (DR)		2	1						
31	T	0	24	mZCL	10YR5/3			2	-	45	45	n	n	///	3a	3a	WE	
		24	32	mZCL	2.5Y7/4	Fe	com	10		13	13	y	n					
		32	43	mZCL	2.5Y7/8	FeMn	com	5	m/poor	16	16	(y)	n					
		43	65	mZCL	7.5YR6/8	grey	many	0	m/poor	22	32	(y)	n					
		65	100	ZL	7.5GY7/1	Fe	many	0	poor	32	8	y	y					

		<u>100</u>	120	ZSt						10	0	n	y					
									Total	137	113			GR.gradient	2o	N		
									MB	42	29			Grass (no clover)				
									Droughtiness grade (DR)		1	1						
32	T	0	38	omZCL	10YR4/1			0	-	106	106	n	n	///	3a	3a	WE	
		38	60	ZL	10Y7/2	Fe	com	0	m/poor	36	40	y	n					
		<u>60</u>	120	ZSt						30	8	n	y					
									Total	172	154			Grass, dark deepened topsoil				
									MB	77	70							
									Droughtiness grade (DR)		1	1						
33	T	0	25	mZCL	10YR4/2			0	-	48	48	n	n	///	3a	3a	WE	
		25	58	mZCL	10YR5/2	Fe	com	0		51	56	y	n					
		58	105	SZL		OMFe		5	m/poor	1	19	y	y					
		<u>105</u>	120	ZSt						8	0	n	y					
									Total	107	122			Grass, dark deepened topsoil				
									MB	12	38							
									Droughtiness grade (DR)		2	1						
34		0	38	omZCL	10YR3/2				-	106	106	n	n	IV	3b	3b	WE	
		38	90	mZCL	2.5Y5/2	Fe	pred	2	poor	38	38	y	y					
		<u>90</u>	120	Zst						15	0	n	y					
									Total	160	145			Grass, dark deepened topsoil				
									MB	65	61							
									Droughtiness grade (DR)		1	1						
35	T	0	32	fSZL	10YR5/3	Fe	com	4	-	69	69	y	n	///	3a	3a	WE GW	
		32	70	fSZL	2.5Y7/8	FeMn	many	5	m/poor	53	67	(y)	n					
		70	100	hZCL	2.5Y8/1	Fe	many	0	poor	18	0	y	y					
		<u>100</u>	120	ZSt						10	0	n	y					
									Total	149	135			GR.gradient	5o	SE		
									MB	54	51			GW.groundwater	springline?			
									Droughtiness grade (DR)		1	1						
36	T	0	25	fSZL	10YR4/3			8	-	52	52	n	n	///	3a	3a	WE GW	
		25	45	fSZL	2.5Y7/8	Fe	com	15		38	38	(y)	n					

		45	75	fSZL	10GY8/1	Fe	com	5	m/poor	15	44	y	n				
		<u>75</u>	120	ZSt						23	0	n	y				
									Total	128	134						
									MB	33	50						
									Droughtiness grade (DR)	1	1						
37	T	0	25	mZCL	10YR5/3	Fe	few	0	-	48	48	n	n	IV	3b	3b	WE
		25	38	mZCL	2.5Y8/1	Fe	many	5	m/poor	18	18	y	n				
		38	65	ZC	2.5Y7/8	&7/2	many	2	poor	25	32	(y)	y				
		65	95	ZCL	7.5GY7/1	Fe	many	0	poor	18	6	y	y				
		<u>95</u>	120	ZSt						13	0	n	y				
									Total	121	104						
									MB	26	20						
									Droughtiness grade (DR)	2	1						

Grass (no clover)
GW. groundwater
60cm

Appendix 3: Pit Descriptions and Photographs

Pit A		Description (grazed grass ley (since 2021) Top 5 cm is thatch (soil with much live and dead roots)
Ap	0-25 cm	Dark greyish brown (10YR4/2) fine sandy silt loam. Friable, small round crumbs <6mm in top 5-10 cm, 10-25cm has subangular blocky structure; fine roots are common throughout
	25-30 cm	50% stone 3-10cm in size.
Bw	30-50 cm	Yellowish brown (10YR5/4) sandy silt loam, unmottled. Apedal/ single grains with no cohesion. 5-10% stone.
BCu	50 cm +	Grey (5Y8/2) mottled fine sandstone.

Geology: Upper Tunbridge Wells Sand

Comment: permeable, unmottled upper subsoil passing to siltstone likely to become slowly permeable within 80cm. Wetness Class II and limited to Grade 2 by wetness and by drought.



Pit B		Description (grazed grassland)
Ap	0-32 cm	Dark greyish brown (10YR5/2) medium silty clay loam. Top 10cm has granular structure, friable, well rooted with earthworms present. 10-32cm fine sub-angular blocky structure. Below 25cm mottles are faint but common.
Eg	32-50 cm	Light yellowish brown (10YR6/4) heavy clay loam, very many mottles. Firm poorly developed (adherent) on one side of pit, moderately developed angular blocky structures on other side.
Btg	50-65 cm	Light brownish grey (2.5Y6/2) silty clay with brownish yellow (10YR6/8) and yellowish red (5YR7/8) common fine mottles. 5% grit stones, coarse very firm subangular blocky structure.
BCg	65 cm-	Light grey dense silty clay loam (Siltstone).
On one side of pit water entered at 30cm (heavy rain in days previous)		

Geology: Upper Tunbridge Wells Mudstone (profiles west of this pit are clayey to depth)

Comment: judged to become slowly permeable at between 40 and 50 cm depth equating to WC III-IV; the latter sets Grade at 3b.



<p>27. 80-100 cm Mottled throughout but no SPL WC II</p> 	<p>9. 50-65 cm Mottled below 40 cm over SP siltstone at 65 cm WC II</p> 	<p>13. 60-80 cm ZL/SZL with some OM penetration (free drain) WC I</p> 	<p>14. 40-50 cm, very mottled ZCL, compact 45 cm (WC IV)</p> 	<p>5. 40-50 cm gleying starts at 45 cm (WC III)</p> 
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20. compact mottled 30-40cm

View from 17 north-east to 18. Moderate slope from footslope up to farmstead. Well drained colluvium (no mottling within 70cm), Grade 2.



2. marshy area on northernmost field (Subgrade 3b).

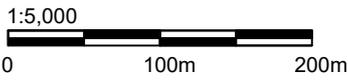
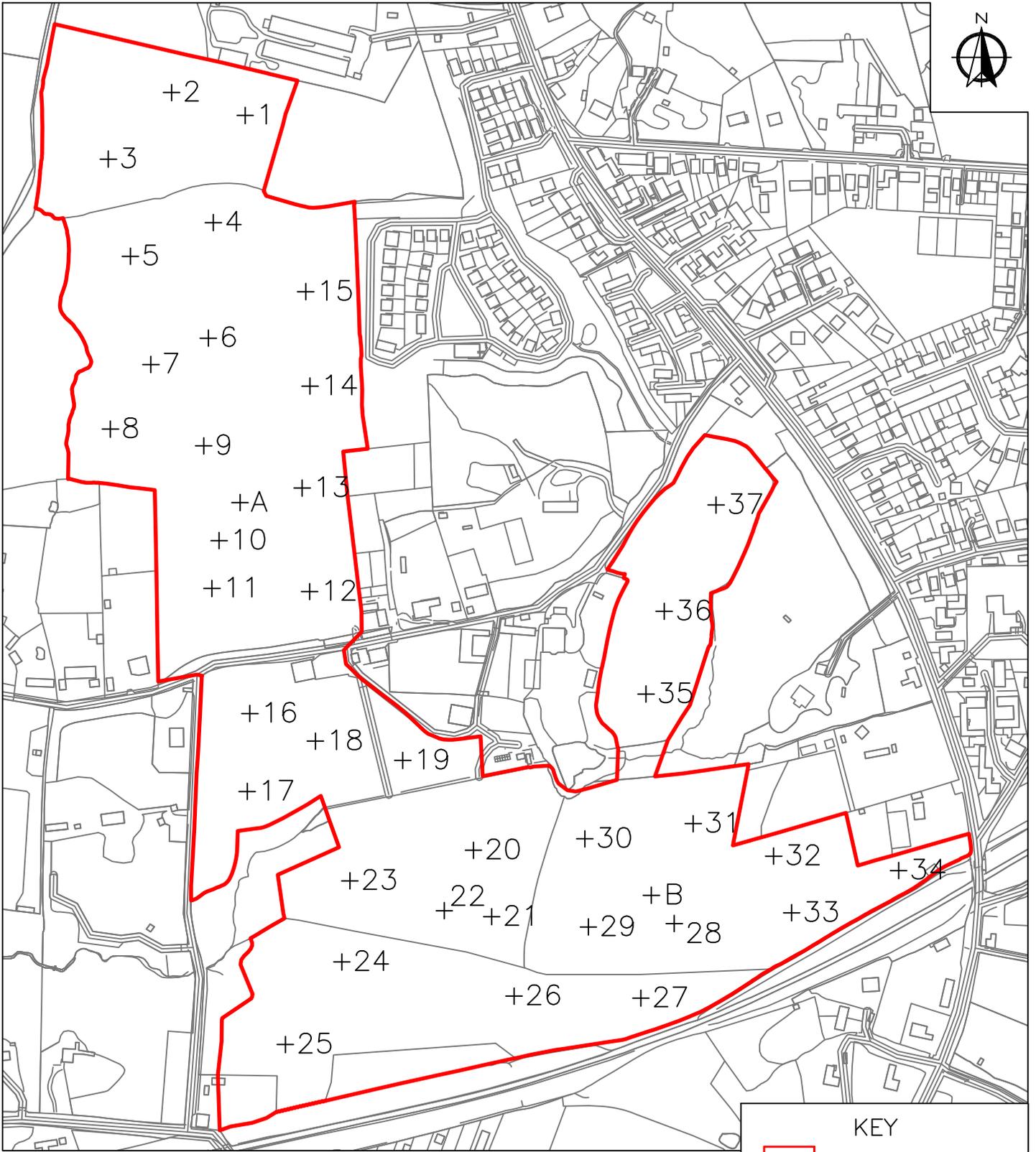


View from 36 northwards to 37. Rush-infected beyond ridge (Subgrade 3b), better drained in foreground (Subgrade 3a) though with some poaching.



View from 33 westwards. Lush grassland. On foreground plateau is deepened organic soil on siltstone (Subgrade 3a). Gully beyond is rush-infected due to springlines (Subgrade 3b), and plateau beyond has slowly permeable clayey subsoil (Subgrade 3b).



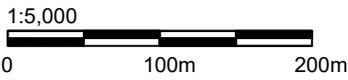
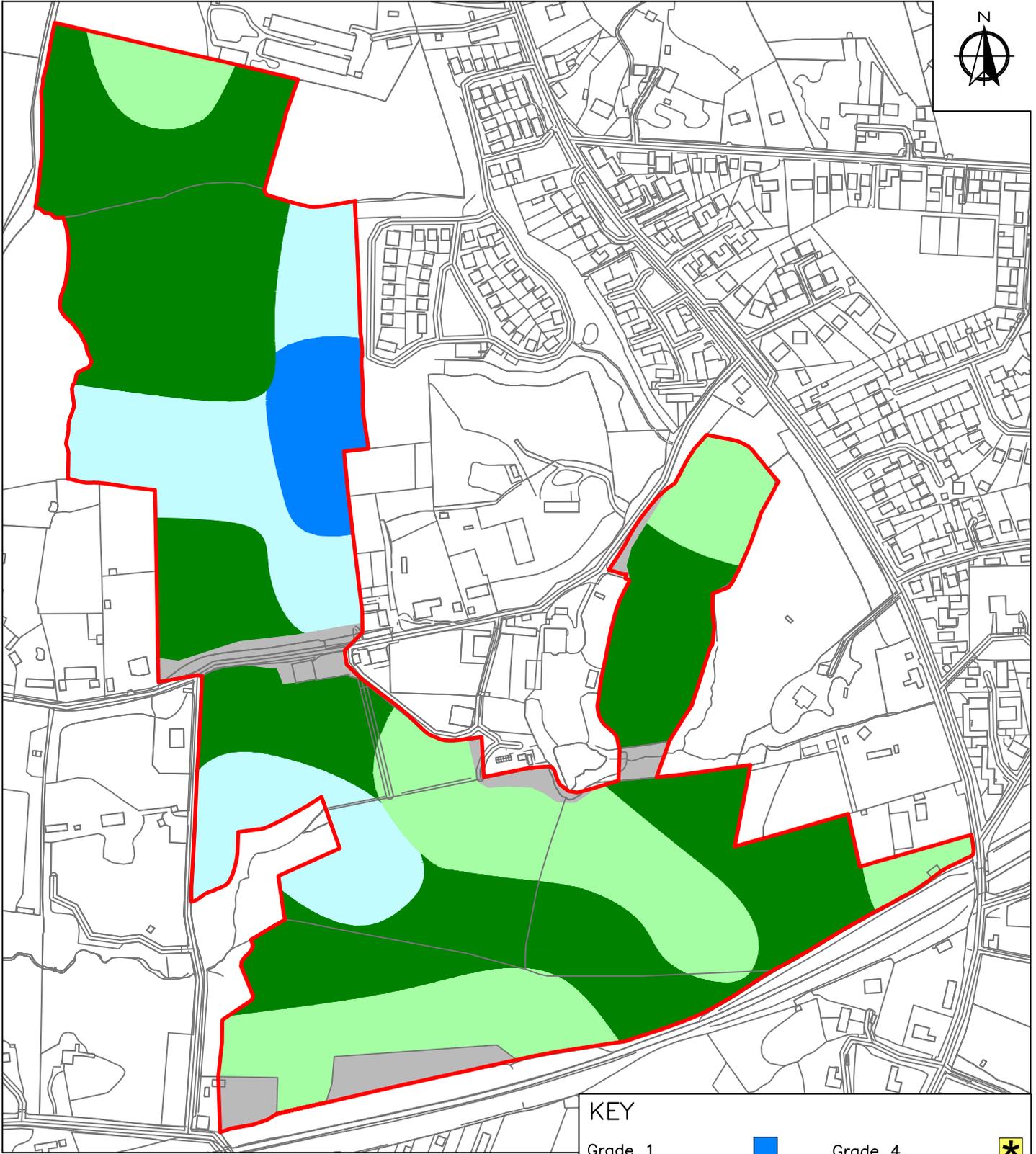


KEY	
	Survey boundary
+1	Observations
+A	Pit

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Contract LAND AT CRAWLEY DOWN, SUSSEX	Drawn by AGM	Checked by AIF				
	Scales 1:5,000@A4	Date 10/2024	Rev.	Comment	Date	





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KEY			
Grade 1		Grade 4	
Grade 2		Grade 5	
Subgrade 3a		Non-agricultural	
Subgrade 3b		Not present	

Drawing title AGRICULTURAL LAND CLASSIFICATION	Ref. RAC/10519/2	Rev.			
Contract LAND AT CRAWLEY DOWN, SUSSEX	Drawn by AGM	Checked by AIF			
	Scales 1:5,000@A4	Date 10/2024	Rev.	Comment	Date

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