



June 2024

Hanbury Properties Limited

Agricultural Land Classification and Soil Resources

at

Land at Woodgate Nurseries, Lidsey Road, Woodgate

Beechwood Court,
Long Toll, Woodcote,
RG8 0RR


www.reading-ag.com

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1 Introduction

- 1.1 Reading Agricultural Consultants Limited (RAC) is instructed by Hanbury Properties Limited to investigate the Agricultural Land Classification (ALC) and soil resources of land at Woodgate Nurseries, Lidsey Road, Woodgate, 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 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 2. 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, landform and drainage

- 2.1 The site extends to approximately 9.8ha comprising a former plant nursery, arable land in two fields, grassland and highways land (Lidsey Road). The site is bounded to the east by Lidsey Road and to the north by the West Coastway Line.
- 2.2 The site is generally flat at an elevation of around 8-10m above Ordnance Datum (AOD), with land drainage primarily through the soil profile.

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 a representative altitude of 10m AOD, and are given in Table 1. The site is wet and moderately warm. Moisture deficits are large. The number of Field Capacity Days is larger than is average for lowland England (150) and is unfavourable for providing opportunities for agricultural field work. There is an overriding climatic limitation to Grade 2.

Table 1: Local agro-climatic conditions

Parameter	Value
Grid Reference	SU 935 042
Average Annual Rainfall	770mm
Accumulated Temperatures >0°C	1,537 day°
Field Capacity Days	157 days
Average Moisture Deficit, wheat	117mm
Average Moisture Deficit, potatoes	114mm

Soil parent material and soil type

- 2.4 The bedrock geology mapped by the British Geological Survey³ at the site is the London Clay Formation, which comprises poorly laminated, blue-grey or grey-brown, slightly calcareous, clay with variable proportions of silt, and sometimes silt or sandy clay.
- 2.5 Superficial river terrace deposits are mapped across the site and include sand and gravel.
- 2.6 The Soil Survey of England and Wales soil association mapping⁴ (1:250,000 scale) shows the Park Gate association across the site, which is characterised by deep, stoneless, silty soils that are variably affected by groundwater. Profiles are typically seasonally waterlogged and assessed as Wetness Class (WC) III or IV. Where appropriate drainage is in place, Park Gate soils are well drained or occasionally waterlogged, and assessed as WC I or II⁵.

3 Agricultural land quality

Soil survey methods

- 3.1 Nine soil profiles were examined using an Edelman (Dutch) auger at an observation density of approximately one per hectare in accordance with the established recommendations for ALC surveys². One soil pit was also excavated within the site boundary, with another pit previously excavated on land to south of the site. Both have been used to inform this assessment in respect of subsoil structures and stone content. The locations of observations are shown on Figure RAC/9197/1. At each observation point the following characteristics were assessed for each soil horizon up to a maximum of 120cm or any impenetrable layer:
- soil texture;
 - stone content;
 - colour (including localised mottling);
 - consistency;
 - structural condition;
 - free carbonate; and

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

⁵ **Jarvis et al (1984)**. *Soils and Their Use in South East England*. Soil Survey of England and Wales Bulletin 15, Harpenden.

- depth.

- 3.2 Two topsoil samples were submitted for laboratory determination of particle size distribution, pH, organic matter content and nutrient contents (P, K, Mg), as shown in Appendix 1. One sample was taken within the site boundary. The second was taken from neighbouring land but is representative of soils found within the site.
- 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.

Agricultural land classification and site limitations

- 3.5 Assessment of agricultural land quality has been carried out according to the revised ALC guidelines¹. Soil profiles have been described according to Hodgson⁶ which is the recognised source for describing soil profiles and characteristics according to the revised ALC guidelines.
- 3.6 Agricultural land quality within the site is limited to Grade 2 by soil droughtiness and wetness.
- 3.7 There is one main soil type present within the site. The topsoil is dark greyish brown (2.5Y4/2 in the Munsell soil colour charts⁷) or dark grey (2.5Y4/1) medium silty clay loam. The stone content is very slight, at 2-5% by volume. The consistency is friable and the structure is medium subangular blocky.
- 3.8 The upper subsoil comprises greyish brown (10YR5/2 or 2.5Y5/2) or dark grey (10YR4/1) medium silty clay loam. The upper subsoil horizons are stoneless, with one recoding of 2%. The soil has a friable consistency and medium to coarse subangular blocky structure. The upper subsoil contains ochreous mottling and is gleyed, indicating imperfect drainage (WC II).
- 3.9 The lower subsoil comprises grey (10YR5/1 or 10YR6/1), greyish brown (10YR5/2) or light olive brown (2.5Y5/3) heavy silty clay loam with no stones. The lower subsoil structure is coarse

⁶ **Hodgson, J. M. (Ed.) (1997).** *Soil survey field handbook*. Soil Survey Technical Monograph No. 5, Silsoe.

⁷ **Munsell Color (2009).** *Munsell Soil Color Book*. Grand Rapids, MI, USA

subangular blocky and the consistency is friable. Ochreous mottling is more pronounced within the lower subsoil, with ferri-manganiferous nodules also observed.

3.10 All profiles are limited by wetness to Grade 2. Where crop moisture deficits are slight, profiles are also limited to the same extent by droughtiness.

3.11 The ALC distribution within the site is shown in Figure RAC/9197/2 and the areas of each grade are given in Table 2. Photographs are given in Appendix 3.

Table 2: ALC areas

Grade	Description	Area (ha)	%
Grade 2	Very good quality	6.5	66
Non-agricultural		3.3	34
Total		9.8	100

Appendix 1: Laboratory Data

Determinand	Sample 1 (Observation 9/Pit 1)	Sample 2**	Units
Sand 2.00-0.063 mm	13	12	% w/w
Silt 0.063-0.002 mm	66	68	% w/w
Clay <0.002 mm	21	20	% w/w
Organic Matter	1.9	1.8	% w/w
Texture	Medium silty clay loam	Medium silty clay loam	
Soil pH	5.5	6.0	

**sample 2 was taken outside the site boundary. However, is representative of soils found on site.

Appendix 2: Soil Profile Summaries and Droughtiness Calculations

Wetness calculations are made 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		
%	TAv	EAv
hard	1	0.5
.		

hard flint & pebble

Climate Data	
MDwheat	117
MDpotato	114
FCD	157

Wetness Class Guidelines	II	III	IV	V
SPL within 80cm, gleying within 40cm	>70cm	42-70cm	<42cm	
SPL within 80cm, gleying at 40-70cm	>55cm	<55cm		
No SPL but gleying within 40cm	coarse subsoil	I	other cases	II

Maximum depth of auger penetration is underlined

Site No.		Depth cm	Texture	CaCO ₃	Colour	Mottle colour	abundance	stone% hard	stone% .	Structure	APwheat mm	AP potato mm	Gley	SPL	WC	Wetness grade WE	Final Grade	Limiting Factor(s)
1	T	0	22	mZCL	n	2.5Y4/2		2			41	41	n	n	II	2	2	WE DR
		22	50	mZCL	n	10YR4/1	Fe	com	0		48	48	y	n				
		50	62	hZCL	n	10YR5/1	Fe	com	0		12	20	y	n				
		62	120	hZCL	n	10YR5/1	Femn	many	0		58	14	y	n				
										Total	159	123						
										MB	42	9						
										Droughtiness grade (DR)		1	2					
2	T	0	30	mZCL	n	2.5Y4/2		2			56	56	n	n	II	2	2	WE DR
		30	52	hZCL	n	10YR5/2	Fe	com	0		36	37	y	n				
		52	95	hZCL	n	10YR5/2	Fe	many	0		43	31	y	n				
		95	120	hZCL	n	2.5Y5/3	Femn	many	0		25	0	y	n				
										Total	160	124						
										MB	43	10						
										Droughtiness grade (DR)		1	2					
3	T	0	24	mZCL	n	2.5Y4/1		2			45	45	n	n	II	2	2	WE DR
		24	40	mZCL	n	10YR5/2	Fe	com	0		27	27	y	n				
		40	60	mZCL	n	2.5Y5/2	Fe	com	0		27	34	y	n				
		60	120	hZCL	n	10YR5/2	Femn	many	0		60	17	y	n				
										Total	159	123						
										MB	42	9						
										Droughtiness grade (DR)		1	2					
4	T	0	30	mZCL	n	2.5Y4/2		2			56	56	n	n	II	2	2	WE DR
		30	62	hZCL	n	2.5Y5/3	Fe	com	0		46	54	y	n				
		62	120	hZCL	n	10YR5/1	Femn	v. many	0		58	14	y	n				
										Total	160	124						
										MB	43	10						
										Droughtiness grade (DR)		1	2					

5	T	0	35	mZCL	n	2.5Y4/2			2		65	65	n	n	//	2	2	WE
		35	72	hZCL	n	10YR5/3	Fe	com	0		48	60	y	n				
		72	120	hZCL	n	2.5Y5/2	Fe	com	0		48	0	y	n				
											Total	161	125					
											MB	44	11					
Droughtiness grade (DR)											1	1						
6	T	0	33	mZCL	n	2.5Y4/2			2		62	62	n	n	//	2	2	WE
		33	77	hZCL	n	10YR5/2	Ferrn	com	0		56	63	y	n				
		77	120	hZCL	n	10YR5/2	Ferrn	many	0		43	0	y	n				
											Total	160	124					
											MB	43	10					
Droughtiness grade (DR)											1	1						
7	T	0	30	mZCL	n	2.5Y4/2			2		56	56	n	n	//	2	2	WE DR
		30	77	hZCL	n	10YR5/3	Ferrn	com	0		61	68	y	n				
		77	120	hZCL	n	10YR5/2	Ferrn	many	0		43	0	y	n				
											Total	160	124					
											MB	43	10					
Droughtiness grade (DR)											1	1						
8	T	0	31	mZCL	n	2.5Y4/2			2		58	58	n	n	//	2	2	WE
		31	65	hZCL	n	2.5Y5/3	Fe	com	0		47	58	y	n				
		65	120	hZCL	n	10YR5/3	Ferrn	many	0		55	9	y	n				
											Total	160	124					
											MB	43	10					
Droughtiness grade (DR)											1	2						
9 Pr 1	T	0	30	mZCL	n	2.5Y4/2			5		54	54	n	n	//	2	2	WE DR
		30	58	mZCL	n	10YR5/3	Fe	com	2		41	47	y	n				
		58	70	hZCL	n	10YR5/3	Ferrn	com	0		12	20	y	n				
		70	120	hZCL	n	10YR5/3	Ferrn	com	0		50	0	y	n				
											Total	158	121					
									MB	41	7							
Droughtiness grade (DR)											1	2						
													USS-mottling common but faint borderline WC I/II Pit stops at 70- full depth observed by auger					

Appendix 3: Photographs

Photographs are taken from two pits. One located at Observation 9, a second located to the immediate south of the site. Both pits are representative of the soils found within the site boundaries.

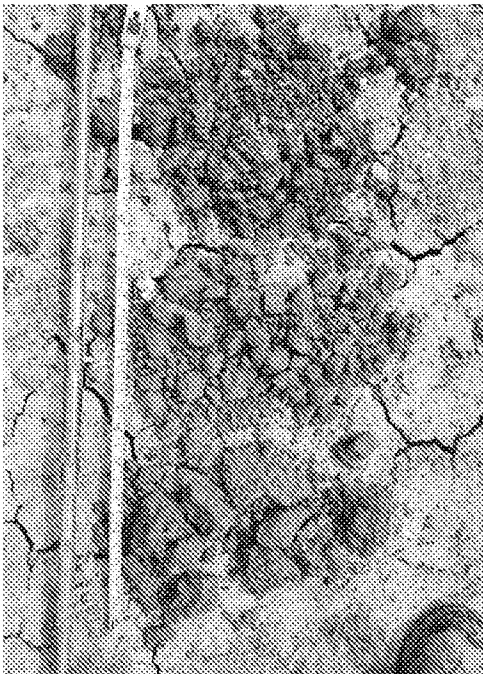
Photographs from 9/P1:



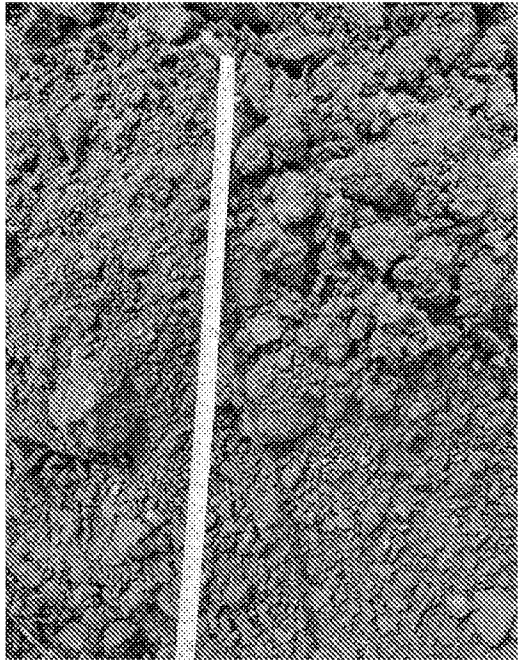
Pit wall



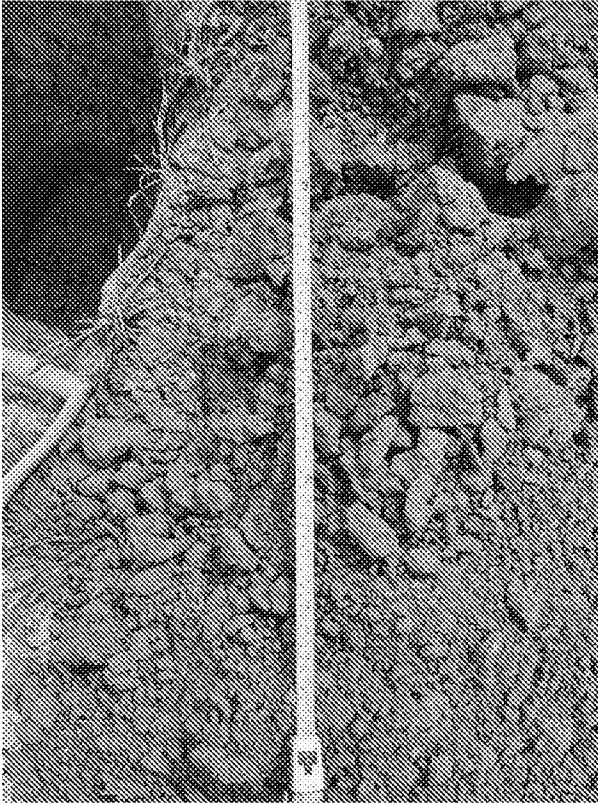
Overview



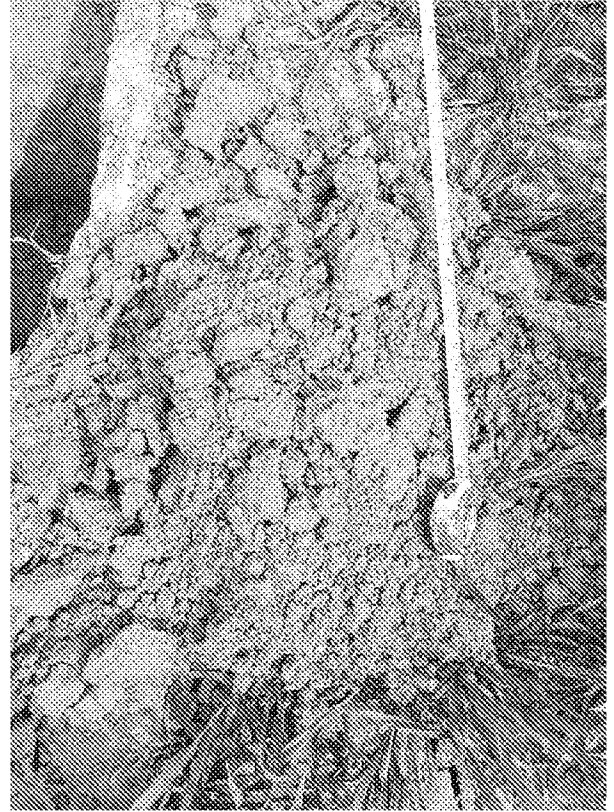
Topsoil, upper subsoil, lower subsoil



Topsoil

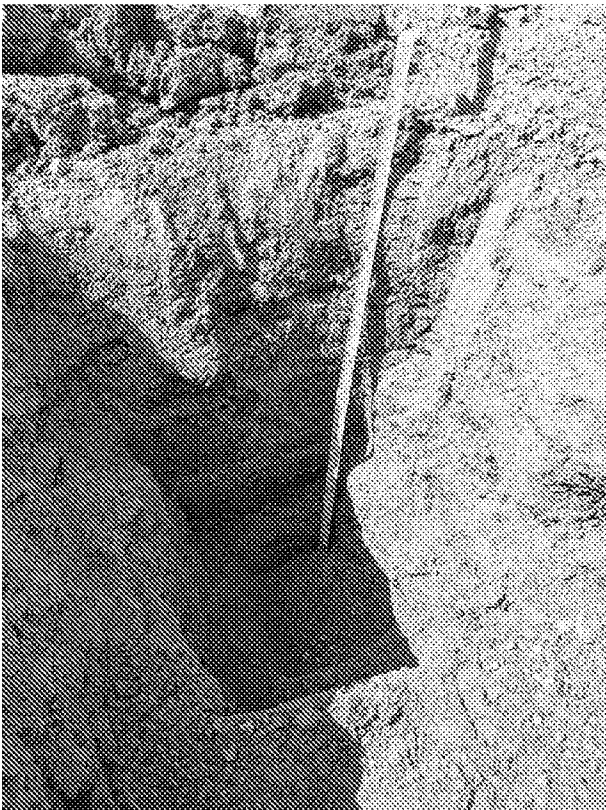


Upper subsoil

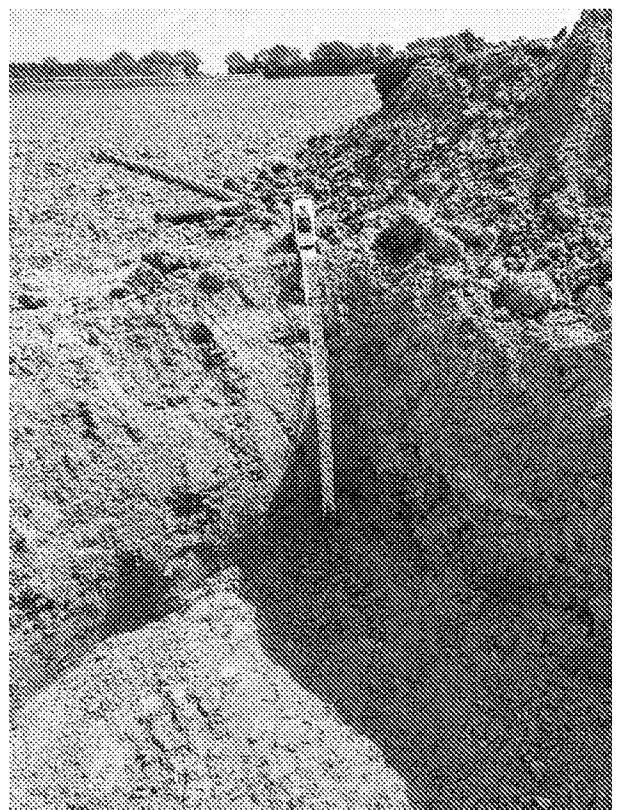


Lower subsoil

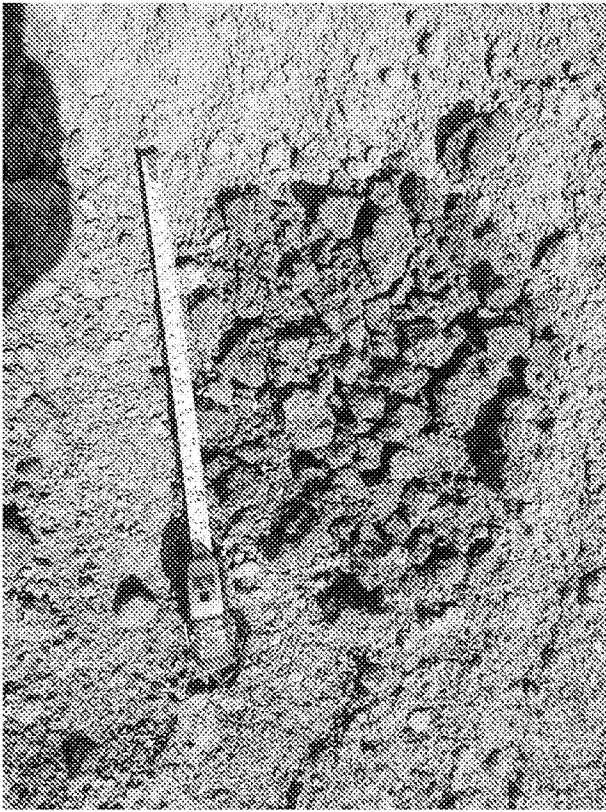
Photographs from pit south of the site:



Pit wall



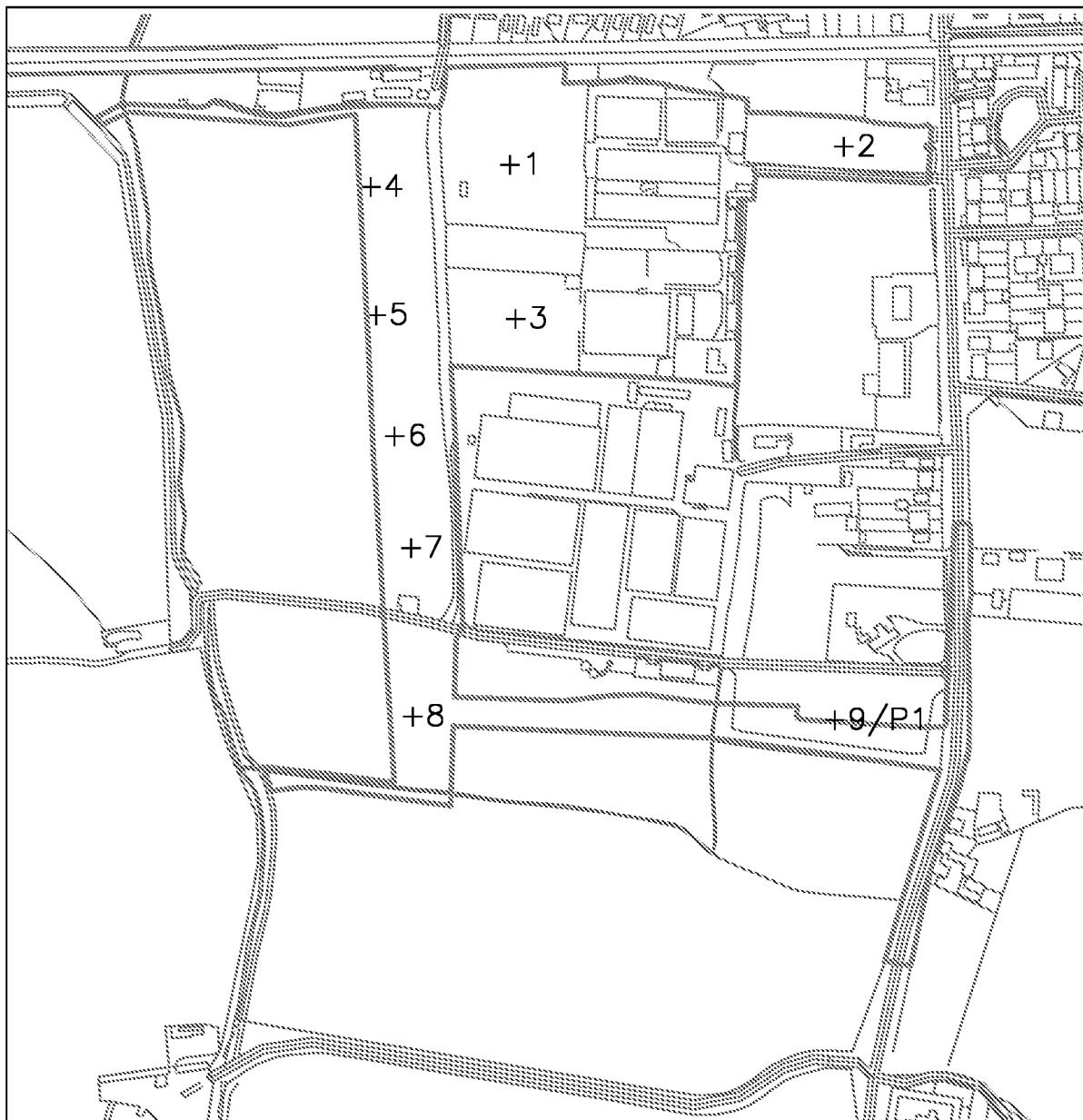
Topsoil depth



Topsoil



Subsoil



1:5,000
0 100m 200m

KEY	
	Survey boundary
+1	Observations

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Contract LAND WEST OF LIDSEY ROAD, WOODGATE, WEST SUSSEX	Drawn by AGM	Checked by AIF				
	Scales 1:5,000@A4	Date 06/2024				
			Rev.	Comment	Date	 READING AGRICULTURAL CONSULTANTS



1:5,000

0 100m 200m

KEY

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

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Contract LAND WEST OF LIDSEY ROAD, WOODGATE, WEST SUSSEX	Drawn by AGM	Checked by AIF				
	Scales 1:5,000@A4	Date 06/2024	Rev.	Comment	Date	