

Agricultural Land Classification Report.

Quadrant 1: Land either side of the A16, South of Tytton Lane East, Boston.



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CONTENTS

1. SUMMARY	1
2. INTRODUCTION	1
3. METHODOLOGY	1
3.1. Fieldwork	1
4. GEOLOGY, SOILS AND PRESENT LAND USE	2
4.1. Geology	2
4.2. Soils.....	2
4.3. Present Land Use	2
5. RESULTS	2
5.1. Climate.....	3
5.2. Site and Flood Limitations.....	4
5.3. Land Quality.....	4
6. MITIGATION	6
6.1. During development.....	7
7. CONCLUSIONS	7

APPENDICES

APPENDIX 1: REFERENCES

APPENDIX 2: AGRICULTURAL LAND CLASSIFICATION MAP

APPENDIX 3: PIT AND AUGER BORING LOCATION PLAN AND DESCRIPTIONS

APPENDIX 4: LABORATORY ANALYSIS

APPENDIX 5: DESCRIPTION OF GRADES AND SUBGRADES

1. SUMMARY

The Agricultural Land Classification of land located either side of the A16, south of Tytton Lane East, Boston was assessed by ADAS in January 2014.

The site is level overall, with slight ridges and depressions especially at the northern end of the site. The soils are variable ranging from deep silty to clayey. Although medium and heavily textured most of the soils are not slowly permeable and are moderately well drained, the exception being in some of the lower lying areas where slowly permeable clay reduces infiltration.

2. INTRODUCTION

This report has been prepared to accompany a planning application for a proposed sustainable mixed-use scheme including a new community stadium for Boston United Football Club, housing, retail, commercial and leisure uses. ADAS UK Ltd was instructed by Signet Planning to carry out a land quality assessment of approximately 28ha of land which would be permanently lost to agriculture as a result of the proposed development. The land is located on the southern outskirts of Boston between the built up area and the railway.

3. METHODOLOGY

A desk study of existing soils and climatic information was undertaken, followed by detailed fieldwork to study soil and site limitations.

3.1. Fieldwork

Fieldwork was undertaken on 14/15th January 2014. The soils were examined to a maximum depth of 120cm. 31 auger borings were studied using a hand auger. Four soil pits were dug in representative locations to determine subsoil characteristics which could not be assessed from the auger borings. Information from the pits and the auger borings was used to determine the Agricultural Land Classification (ALC) of the site (results at Appendix 2). Four soil samples were collected for accurate determination of soil texture (by laboratory analysis of particle size distribution).

The land was classified using the system in the Ministry of Agriculture, Fisheries and Food (MAFF now Defra) publication *Agricultural Land Classification of England and Wales - Revised guidelines and criteria for grading the quality of agricultural land*, (October 1988). ⁽¹⁾

4. GEOLOGY, SOILS AND PRESENT LAND USE

4.1. Geology

The site is covered in deposits of marine alluvium (tidal flats) which are composed of silts and clays on this site. The resulting soils are variable in character.

4.2. Soils

The soils of the area have been mapped by the Soil Survey of England and Wales at a scale of 1:250,000 ⁽²⁾. These are stoneless silty and silty over clayey soils which have formed in marine alluvium. The soils are mainly porous and groundwater is controlled by drains and ditches and the soils typically fall into wetness class 2. In areas of heavy clay loam and clay subsoil the soils are wetter and harder to work and fall into wetness class 3.

The site lies in a dry area of the country and the soils can be slightly prone to drought in dry years.

Fieldwork for this report confirmed the presence of medium and heavy textured soils, which were well to imperfectly drained; they fell into wetness classes 1 - 3.

4.3. Present Land Use

The entire site was in arable use. At the time of survey winter cereals were growing in the largest field and other fields were ploughed and fallow after growing arable crops last year.

5. RESULTS

The Provisional Land Classification Maps ⁽³⁾ show the area as Grade 1. These

maps were produced to provide guidance on land quality for land-use planning purposes. They are only accurate to about 80ha and are not sufficiently accurate for use in the assessment of individual fields or development sites, where soils can vary over short distances. They consider the inherent potential of the land under a range of farming systems so the current use or intensity of use does not affect the ALC grade ⁽⁷⁾. Detailed fieldwork undertaken using the revised ALC guidelines, indicates that the classification is more variable than the Provisional Land Classification Maps would indicate, ranging from Grade 1 to Subgrade 3b.

5.1. Climate

The site occupies generally level land to the south of Boston, Lincolnshire. Summarised below are the main climatic parameters ⁽⁴⁾ used in the determination of land quality:

Climatic parameters	
Site at: Tytton Lane, Boston Altitude: 3m	Grid ref: TF321416
Accumulated temp. (Jan–June) (degrees C)	1432
Annual average rainfall (mm)	591
Duration of field capacity (days)	112
Moisture deficits for wheat (mm)	119
Moisture deficits for potatoes (mm)	115

The combination of rainfall and temperature is generally favourable for crop growth and indicates that the site does not have any climatic constraints that would limit ALC grading.

5.2. Site and Flood Limitations

The area was level with shallow depressions and slight ridges and there was no gradient limitation.

River or sea flooding occurs over most of the site, as indicated in the flood section of the Environment Agency website ⁽⁵⁾. The whole site lies in Flood Zone 3, i.e. an area which will flood more than 1 in 100 years from river flooding and 1 in 200 years from sea flooding, if the area was not protected by flood defences. The main rivers have flood embankments which reduce the risk of flooding to the extent that this land has been drained and is intensively farmed. For the purposes of this study it has been assumed that the land is sufficiently well protected to be eligible for Grade 1 if the soils are suitable (i.e. it has no more than very rare (less than 1 in 15 years) short summer floods and rare (1 in 10 – 14 years) short winter floods). If more information becomes available in the future or if climate change makes the risks greater, as is anticipated in the flood report for the site ⁽⁶⁾, the classification may have to be reconsidered.

5.3. Land Quality

The land quality of this site ranges from Grade 1 to Sub grade 3b. A full description of the grades can be found at Appendix 5.

Grade 1

This Grade accounts for 11.8 % of the site; it was mapped to include deep medium silty clay loam to sandy silt loam soils which overlie similar or lighter textured subsoils.

The soils showed signs of seasonal wetness in the form of gley colours and mottles in the lower subsoil but they were not slowly permeable and fell into wetness class 1.

The soils hold sufficient water to enable crop growth in all but the driest years; they have a moisture balance of more than +30mm for wheat and +10mm for potatoes.

Grade 2

This Grade accounts for 60.6 % of the site. It was mapped to include soils which typically had medium silty clay loam and medium clay loam soils which overlaid similar textured subsoils. The soils were either gleyed and mottled at depths below 40cm or gleyed within 40cm and had a slowly permeable layer at depths below 57cm; they fell into wetness class 2 and with a medium silty clay loam or medium clay loam topsoil these areas could not be graded higher.

On the edge of the Grade 1 land sandy silt loam and medium clay loam soils were underlain by similar or lighter textured subsoil and in this area the soils did not hold sufficient water to protect against drought. The soils had a moisture balance of better than +5 mm for wheat and -10mm for potatoes and so fell into Grade 2.

Grade 3

This grade has been divided into Subgrades 3a and 3b to separate the higher quality land (Subgrade 3a) from that at the lower end of the grade (Subgrade 3b).

Subgrade 3a

This Subgrade accounts for 18.5% of the site and was mapped to include deep medium silty clay loam and medium clay loam topsoils which overlaid similar or heavier subsoils. They were gleyed and mottled within 40cm and slowly permeable within 57cm of the surface. Isolated profiles which have a heavy silty clay loam topsoil were also included in this Subgrade.

Subgrade 3b

This Subgrade accounts for 2.7% of the site and was mapped to include the heavier soils which showed signs of impeded drainage. The topsoil was typically heavy silty clay loam to silty clay and overlaid similar or heavier subsoils. The soils were gleyed and mottled within 40cm and slowly permeable within 57cm. The soils fell into wetness class 3 and with heavy textured topsoil they could not be graded higher.

Grade 4

No land of this quality is present on the site.

Grade 5

No land of this quality is present on the site.

Non agricultural

Grass verges, and area of scrub and small shelter belts have been mapped as non agricultural.

A Summary of Land Quality

GRADE	Area (ha)	% Total site	% Lincolnshire⁽⁸⁾
1	3.31	11.8	13.0
2	17.07	60.6	31.1
3a	5.21	18.5	46.9
3b	0.76	2.7	
4	0.0	0.0	1.8
5	0.0	0.0	0.0
Non Agricultural + Urban	1.81	6.4	7.2
Total	28.17	100.0	100.0

6. MITIGATION

The figures in the table above show that the proportion of Grade 1 on site is lower than for the county of Lincolnshire. As is typical of land around Boston the site supports mainly good quality agricultural use.

This detailed survey shows that land quality on this site is not as good as the Provisional Maps suggest with most of the site being mapped as a mix of

Grades 2 and Subgrade3a with some Grade 1 and Subgrade 3b.

A search of the Magic database indicated that this mix of grades is typical of detailed land classifications in the area making it difficult to avoid using at least a proportion of high quality agricultural land for large-scale development in this area.

Although much of the site would be permanently lost to agriculture there are large areas of 'green use' in the proposed design and this land could be returned to agriculture at some stage in the future if the need arose. In addition some of the soil functions will be retained if the soils are managed sympathetically.

6.1. During development

The land would be permanently lost to agriculture but the excavated soils can be preserved for use in the gardens of the new houses to provide a greater depth of soil or to landscape other parts of the development. Any surplus soils could be exported off site for use on sites where soils are in short supply with appropriate planning permission and permits.

All topsoils should be stripped and stored separately from any subsoil. The soils should be restored in the correct sequence to ensure that the topsoil is returned as the surface layer.

As much soil as possible should be preserved in situ and left uncovered to preserve its other important ecosystem services such as carbon storage and water regulation.

7. CONCLUSIONS

The 1:250,000 scale Provisional Land Classification Map of the area shows the site as Grade 1.

The detailed fieldwork undertaken for this study has shown that the land is mapped as a mix of Grade 1 to Subgrade 3b because in parts of the site the soils are either too wet or too prone to droughtiness to be classified higher.

Although mainly mapped as 'best and most versatile' land, in the future risks

to the agricultural land from flooding may reduce the quality of the whole site. Many of the soil functions can be preserved by sympathetic design and reuse of the soils both on and off site.











APPENDIX 1: REFERENCES

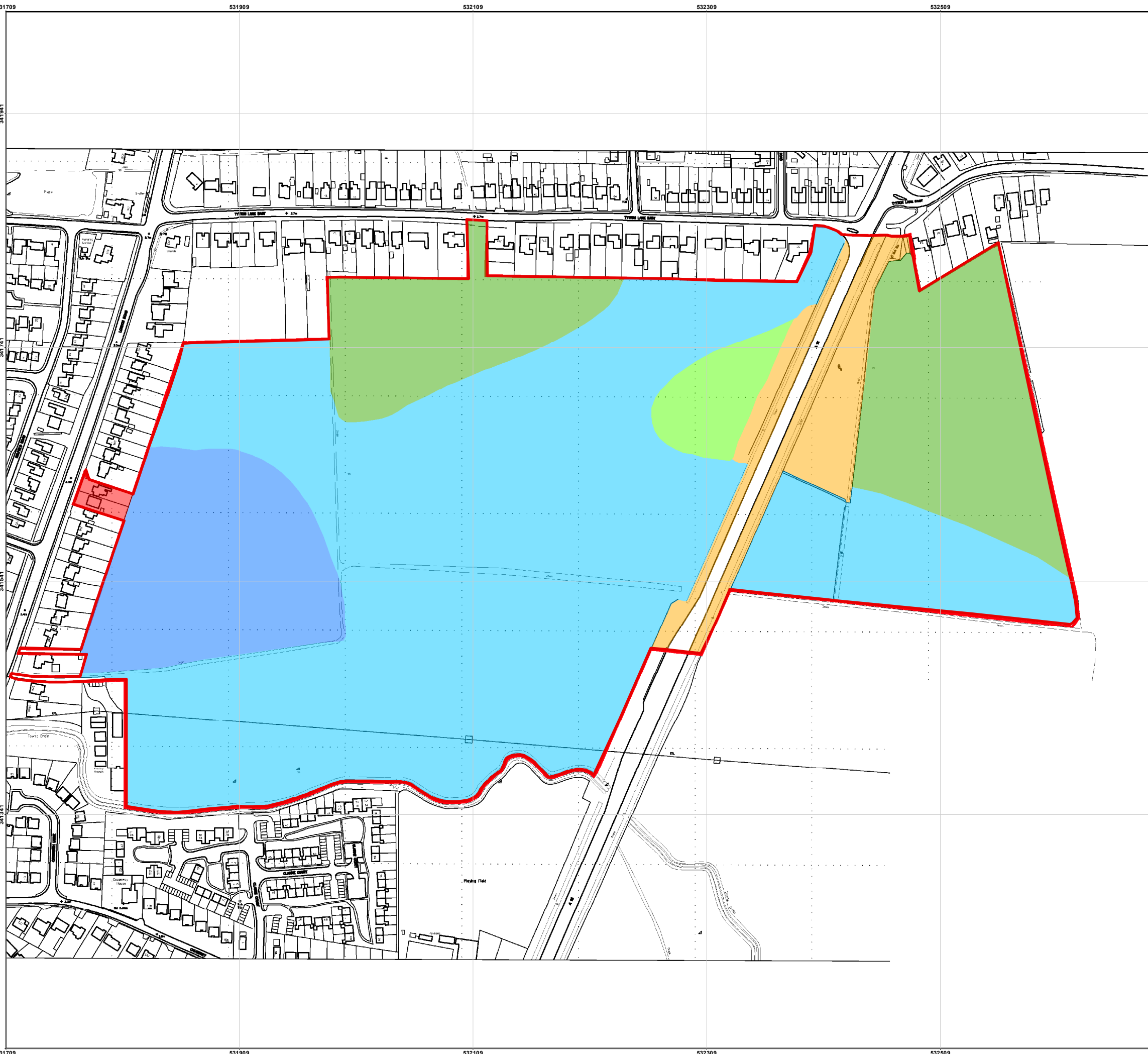
1. MAFF, 1988. *Agricultural Land Classification of England & Wales Revised guidelines and Criteria for grading the quality of Agricultural Land*. MAFF (Publications) Alnwick.
2. Soil Survey of England & Wales, 1983, *Soils of Midland and Western England*, Sheet 3, 1:250,000 scale.
3. MAFF, 1970. *Provisional Agricultural Land Classification Map*, 1:250,000 scale.
4. Meteorological Office, 1989. *Climate data from the published agricultural climatic dataset*.
5. Environment Agency, 2012. website:
<http://www.environment-agency.gov.uk/homeandleisure/floods>
6. AECOM, 2013; Technical Note: **Tytton Lane Development Site**
Job No: 60309630 Summary of opportunities/constraints to input into overall Master plan
7. Natural England 2012: *Technical Information Note TIN049 2nd edition*.
8. MAFF (Defra) 1983 Note TN/RP/01 *Agricultural Land Classification of England and Wales The distribution of the Grades*

**APPENDIX 2: AGRICULTURAL LAND CLASSIFICATION MAP
(SEE OVERLEAF)**

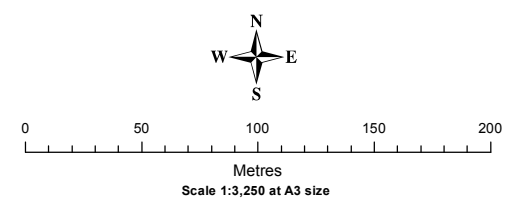
Tytton Lane
Boston

Agricultural Land Classification

-  Site Boundary
-  Grade 1
-  Grade 2
-  Sub-Grade 3a
-  Sub-Grade 3b
-  Grade 4
-  Grade 5
-  Non Agricultural
-  Urban
-  Not Surveyed



Drawn by Laura Donnelly 14/02/2014, Verified by Rosemary Peel 14/02/2014



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APPENDIX 3: PIT AND AUGER BORING LOCATION PLAN AND DESCRIPTIONS (SEE OVERLEAF)

TYTTON LANE BOSTON AGRICULTURAL LAND CLASSIFICATION SURVEY PIT AND AUGER BORING TABLES

Keys common to all tables

Texture Key

S = sand
Z = silt
C = clay
L(y) = loam(y)

F = fine
M = medium
C = coarse
Pt(y) = peat(y)

Structure Key

(V)Wk = (very)weak
F = fine
SG = single grain

M = moderate
M = medium
GR = Granular
AB = angular blocky

S = strong
C = coarse
SAB = subangular blocky
PR = prismatic

Colour key

Br = brown
Rd = red
Ol = olive

Bl = black
Or = orange
st = strong

Yl = yellow
pl = pale

Main Limitation

DR = Drought
GR = Gradient

WE = Wetness
MR = Microrelief

CL = Climate
TX = Texture

Land use

Wh = wheat

Bar = barley
wc = winter cereals

perm past = permanent
pasture
r&f = ridge and furrow

Osr = oil seed rape

fal = fallow

Slope

V = very
AL = almost level

G = gentle
L = level

S = slope
mod = moderate

Others abbreviations

ab = abundant
MB = moisture balance
occ = occasional/ly
pot = potatoes
SPL = slowly permeable layer
OM = organic matter

cons = concretions
Mn = manganese
och = ochreous
sat = saturated
na = not applicable

imp = impenetrable
mot = mottles
pok = pockets

CaCO₃ Tests

All topsoils and upper subsoils tested with a 10% solution of HCl to estimate levels of Calcium carbonate in the soil - noted as non calc (no reaction), slightly calc (audible) or calc (visible)

Site: TYTTON LANE BOSTON

All profiles were tested with a 10% solution of Hydrochloric acid and are non calcareous unless specified as calcareous.

PIT DESCRIPTIONS

Pit	Depth (mm)	Colour	Texture	Structure	Drainage /Porosity	Total Stone
1 Winter cereals	360	7.5YR4/2 Dk gr br	MCL	M,C, AB, mainly friable	- />	<1%, flint
	620	10YR4/2 Dk gr br	MZCL,	St, M,AB, mainly friable	gleyed och many / >	"
	100	10YR 4/2, 5/3	HZCL	St,C,AB	gleyed, och many/>	"
	Gleyed at: 360	SPL at: no spl	Wetness class: 2	Wetness grade: 2	Comments: wet to north west	
		MB wheat: +38 MB pot: +6	DR Grade: 2	Main limitation. Wetness/DR		ALC grade 2

Pit	Depth (mm)	Colour	Texture	Structure	Drainage /Porosity	Total Stone
2 Ploughed	360	10YR4/3, dk br	MZCL	M,M,SAB, friable. Firm plough pan 260-300mm	-/>	<1%, mixed
	800+	10YR4/2 dk gr br	MZCL	C,PR breaking to M,M,AB. Friable	gleyed, och com / >	"
	Gleyed at: 360	SPL at: >800	Wetness class: 2	Wetness grade: 2	Comments: Almost level, wet hollow to south.	
		MB wheat: +42 MB pot: +10	DR Grade: 1/2	Main limitation. Wetness		ALC grade 2

Pit	Depth (mm)	Colour	Texture	Structure	Drainage /Porosity	Total Stone
3 Winter cereals	340	10YR4/3, dk br	HZCL	M,M,SAB, massive 300-400	-/> <	<1%, mixed
	550	7.5YR5/3 pl br	HZCL	C,PR breaking to M,C,AB. Firm	gleyed, och ab / <	"
	550+	too wet to dig,				
	Gleyed at: 340	SPL at: 350	Wetness class: 3	Wetness grade: 3b (non calcareous topsoil)	Comments: pit filled with water, seeping in from 200 and 300mm depth	
		MB wheat: =6 MB pot: _8	DR Grade: 2/3a	Main limitation. Wetness		ALC grade 3b

Pit	Depth (mm)	Colour	Texture	Structure	Drainage /Porosity	Total Stone
4 ploughed	280	10YR4/3 Dk gr br	HZCL	M,M, SAB,	- />	<1%, hard
	450	7.5YR5/4 Br	MZCL,	M,PR breaking to M,M,AB, friable. Firm in platy layer at 300-330	- />	"
	550	7.5YR5/4 Br	MZCL,	M,PR breaking to M,M,AB. Friable	gleyed och com / >	"
	800+	7.5YR 5/3	HZCL	M,C,PR to platy bedding planes. Friable	gleyed, och many/>	"
	Gleyed at: 450	SPL at: no spl	Wetness class: 2	Wetness grade: 3a (non calc topsoil)	Comments: Common large worm channels to base of pit.	
		MB wheat: +14 MB pot: +1	DR Grade:	Main limitation. Wetness		ALC grade 3a

AUGER BORING DESCRIPTIONS

No / land use	Bottom depth of horizon	Texture	Colour	Gleyed / spl	% Stone >2cm /total	Moisture balance / Wetness Class	Main Limitation	Grade
1 winter cereals	350	HZCL	Br	-	<1%			
	480	HZCL	Pl br	gleyed och com/-	<1%			
	750+	HZCL/ZC	Pl gr br	gleyed och many	<1%	3	WE	3b
Comment: whole site is almost level with very slight ridges and gullies								
2	330	MZCL	Br	/	<1%			
	520	SZL/FSL	Pl br	gleyed och com / -	<1%			
	600	HZCL	Pl br	gleyed och many/ spl	<1%			
	800+	HZCL	gr br	och many / spl	<1%	3	WE	3a
3	320	HZCL	Br	sat-	<1%			
	650	HZCL/ZC	br + gr br	gleyed och many/-	<1%			
	800+	HZCL	rd gr	och many	<1%	3	WE	3b
4	330	MZCL	Br	-	<1%			

11	320	HZCL	Br	sat, anaerobic litter layer	<1%			
	750	HZCL	PI br, more gr br with depth	gleyed och com / spl	<1%			
	1000+	HZCL	Gr br	gleyed och many	<1%	3	WE	3b
11a	340	HZCL	Br	sat,	<1%			
	750	HZCL	PI br	gleyed och com / spl	<1%			
	1000+	HZCL	Gr br	gleyed och many	<1%	3	WE	3b
12 narrow strip by road - scrub								
13 ploughed	350	HZCL non calc	Br,	-	<1%			
	500	HZCL non calc	PI br, more gr br with depth	gleyed och com	<1%			
	1000+	MZCL sl calc	Gr br	gleyed och many	<1%	2	WE	3a
14	350	SZL	Br	-	<1%			
	420	SZL	Lt br	och few	<1%			
	500	LFS	Lt br	och many	<1%			
	600	FZCL	PI br	gleyed och many	<1%			
	1000	LFS +SZL +SCL	Gr br	och com	<1%	2	WE	1
15	340	SCL	Br	-	<1%			
	560	SCL	Lt br	och few by 450	<1%			
	650	FSL	PI br	gleyed, och many	<1%			
	900	LFS	Gr br,	sat, gleyed och many	<1%	MB wh 33, pot -2 / 1		
	1100	HCL	Gr br	och com	<1%		DR	2
16	350	MCL	Br	-	<1%			
	480	FSL	Lt br,	-	<1%	MB wh 60, pot 3 / 1		
	1000+	LFS	Lt br	och few	<1%		DR	2
17	330	MCL	Br	-	<1%			
	620	MCL	PI br	och com	<1%			
	800	HZCL	PI gr br	och many	<1%			
	1000	HZCL	PI br,	och com	<1%	2	WE	2

18	330	MCL	Br	-	<1%			
	420	MZCL	Lt br	och few	<1%			
	710	SZL	Lt br	och com, many by 680	<1%			
	1000	ZC/C	Gr br	och com	<1%	2	WE	2
19	350	ZCL/ZL	Br	-	<1%			
	650	SZL + ZL + ZCL horizons	Lt br,	och few by 600	<1%	MB wh 47, pot 33 / 1		
	1000+	ZCL +ZL	PI br	och com	<1%		WE	1
20	340	MZCL sl calc	PI br, more gr br with depth	och com	<1%			
	620	ZCL sl calc	PI br,	och few by 600	<1%			
	1000+	HZCL +ZL, sl calc	Dk gr br, more rd gr with depth	och com	<1%	2	WE	2
21	340	MZCL	Br,	-	<1%			
	500	MZCL	PI br,	och com	<1%			
	1000+	HZCL	Dk gr br	och many	<1%	3	WE	3a
22	350	ZL	Br	-	<1%			
	520	ZL	Lt br	-	<1%			
	600	SZL +FSL	PI br	och com,	<1%			
	700	LFS	PI br	och com, sat at 700	<1%			
	900	FSCL + LFS poks	Gr br	och many , sat	<1%	MB wh 63, pot 28 / 1		
	1100	HCL	Gr br	och many	<1%			1
23	370	SZL	PI br	-	<1%			
	600	SZL	Lt br	-	<1%			
	850	FSL + LFS	PI br	och com	<1%	MB wh 58, pot 28 / 1		
	1000	MCL + FSL	Gr br	och com			WE	1
24	350	SZL/MCL	Br	-	<1%			
	680	FSL + LFS	Lt br	-	<1%			
	900	SZL + SCL poks	PI br	och com	<1%	MB wh 58, pot 24 1		
	1000	ZCL	Gr br	och com				1
25	360	MCL/ZCL	Br	-	<1%			
	630	MCL	PI br	och many	<1%			
	1000	MCL	PI br + gr	och many		2	WE	2

26	330	MCL	Br	-	<1%			
	450	MCL	Lt br	-	<1%			
	650	MCL/ZCL	PI br	och many	<1%			
	1000	MCL (sandy)	Gr br	och ab	<1%	2	WE	2
27	330	HZCL	Br	-	<1%			
	420	HZCL	PI br	-	<1%			
	600	C	PI gr br	och com	<1%			
	1000	ZCL	PI br	och com		2	WE	3a
28	340	MZCL	Br	-	<1%			
	650	MZCL	PI br,	och many	<1%			
	1000	ZC	Gr br	och many		2	WE	2
29	330	MZCL	Br	-	<1%			
	650	MZCL	PI br	och many	<1%			
	1000	C/HCL	Gr br	och many		2	WE	2
30	350	HZCL	Br	-	<1%			
	460	ZC	Gr br	och com	<1%			
	650	MZCL	PI br	och com				
	1000	ZC	pl br + gr	och many/ spl		2	WE	3a

APPENDIX 4: LABORATORY ANALYSIS (SEE OVERLEAF)



ANALYTICAL REPORT

Report Number	22495-14	X922	ROSEMARY PEEL	Client TYTTON LANE
Date Received	20-JAN-2014		ADAS ENVIRONMENT GROUP	BOSTON
Date Reported	28-JAN-2014		PARKFIELD COTTAGE	
Project	SOILS 15 01 2014		POLLARDS LANE	
Reference	TYTTON LANE BOSTON		SOUTHWELL	
Order Number			NOTTS NG25 0TL	

Laboratory Reference		SOIL247521	SOIL247522	SOIL247523	SOIL247524						
Sample Reference		PIT 1 TOPSOIL	PIT 2 TOPSOIL	PIT 3 TOPSOIL	PIT 4 TOPSOIL						
Determinand	Unit	SOIL	SOIL	SOIL	SOIL						
Sand 2.00-0.063mm	% w/w	33	22	14	14						
Silt 0.063-0.002mm	% w/w	42	54	51	57						
Clay <0.002mm	% w/w	25	24	35	29						
Textural Class		1	1	31	27						

Notes

Analysis Notes The sample submitted was of adequate size to complete all analysis requested.
 The results as reported relate only to the item(s) submitted for testing.
 The results are presented on a dry matter basis unless otherwise stipulated.

Document Control **This test report shall not be reproduced, except in full, without the written approval of the laboratory.**

** Please see the attached document for the definition of textural classes.

Reported by *J Doyle*
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Textural Class Definitions

Code	Textural Class
1	Clay Loam
2	Clay Loam/Sandy Clay Loam/Sandy Clay
3	Clay Loam/Sandy Clay
4	Clay Loam/Sandy Silt Loam
5	Clay Loam/Sandy Silt Loam/Sandy Loam/Sandy Clay Loam
6	Clay Loam/Silty Clay Loam
7	Clay
8	Clay/Clay Loam
9	Clay/Clay Loam/Sandy Clay
10	Clay/Sandy Clay
11	Clay/Silty Clay
12	Clay/Silty Clay/Silty Clay Loam/Clay Loam
13	Loamy Sand
14	Loamy Sand/Sandy Loam
15	Sand
16	Sand/Loamy Sand
17	Sandy Clay Loam
18	Sandy Clay Loam/Clay Loam
19	Sandy Clay Loam/Sandy Loam
20	Sandy Clay
21	Sandy Clay/Sandy Clay Loam
22	Sandy Loam
23	Sandy Silt Loam
24	Sandy Silt Loam/Sandy Loam
25	Sandy Silt Loam/Silt Loam
26	Silt Loam
27	Silty Clay Loam
28	Silty Clay Loam/Silt Loam
29	Silty Clay Loam/Silt Loam/Sandy Silt Loam/Clay Loam
30	Silty Clay
31	Silty Clay/Silty Clay Loam

APPENDIX 5: DESCRIPTION OF GRADES AND SUBGRADES

The ALC grades and Sub grades are described below in terms of the types of limitation which can occur, typical cropping range and the expected level and consistency of yield. In practice, the grades are defined by reference to physical characteristics and the grading guidance and cut-offs for limitation factors in Section 3 (of the ALC book) enable land to be ranked in accordance with these general descriptions. The most productive and flexible land falls into Grades 1 and 2 and Sub grade 3a and collectively comprises about one-third of the agricultural land in England and Wales. About half the land is of moderate quality in Sub grade 3b or poor quality in Grade 4. Although less significant on a national scale such land can be locally valuable to agriculture and the rural economy where poorer farmland predominates. The remainder is very poor quality land in Grade 5, which mostly occurs in the uplands.

Descriptions are also given of other land categories which may be used on ALC maps.

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 and horticultural crops can usually be grown but on some land in the 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.

Grade 3 - good to moderate quality agricultural land

Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

Sub grade 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.

Sub grade 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 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 agriculture land

Land with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

Description of other land categories used on ALC maps

Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture including: housing, industry, commerce, education, transport, religious buildings, and 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: golf courses, private parkland, public open spaces, sports fields, allotments and soft-surfaced areas on airports/airfields. 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 (e.g. 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 land cover types, e.g. buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will usually be shown.