

**AGRICULTURAL QUALITY  
OF LAND OFF RADWINTER ROAD  
SAFFRON WALDEN**

Report 1777/1

24<sup>th</sup> February 2021

**AGRICULTURAL QUALITY  
OF LAND OFF RADWINTER ROAD, SAFFRON WALDEN**

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Report 1777/1  
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## **SUMMARY**

An agricultural land quality survey has been undertaken of 17.1 ha of land off Radwinter Road, Saffron Walden.

The land has a mixture of moderately shallow soils over chalk and deeper soils with impeded drainage over chalky glacial till. Land quality is mainly limited to subgrade 3a by droughtiness and/or wetness. An area in the centre of the site has deeper freely-draining soils and is of grade 2 quality.

## 1.0 Introduction

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- 1.1 This report provides information on the soils and agricultural quality of 17.1 ha of land off Radwinter Road, Saffron Walden.

### **SITE ENVIRONMENT**

- 1.2 The survey area covers two fields, bordered to the north by Radwinter Road, to the west by residential development and to the south and east by adjoining agricultural land. The site is gently sloping, at an average elevation of approximately 90 m AOD.
- 1.3 At the time of survey the land of the larger field was under arable cropping, and the small field in the north under grass.

### **PUBLISHED INFORMATION**

- 1.4 1:50,000 scale BGS information records the solid geology of the land as Lewes Nodular Chalk Formation. Chalky glacial till of the Lowestoft Formation is recorded to overlie the chalk in the east of the site.
- 1.5 The National Soil Map (published at 1:250,000 scale) records the land as Swaffham Prior Association, typically moderately shallow loamy calcareous soils over chalk or chalk rubble. In the south-east Hanslope Association is recorded: deep clayey calcareous soils with impeded subsoil drainage formed in chalky till<sup>1</sup>.

<sup>1</sup>Hodge, C.A.H. *et al.*, (1984). *Soils and their use in Eastern England*. Soil Survey of England and Wales Bulletin No. 13, Harpenden.

## 2.0 Soils

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2.1 A detailed soils and agricultural quality survey was carried out in February 2021 in strict accordance with MAFF (1988) guidelines<sup>2</sup>. It was based on observations at intersects of a 100 m grid, giving a density of one observation per hectare. During the survey, soils were examined by a combination of pits and augerings to a maximum depth of 1.1 m. A log of the sampling points and a map (Map 1) showing their locations are in an appendix to this report.

2.2 The soils were found to vary in depth and drainage, as described below.

### **MODERATELY SHALLOW LOAMY SOILS**

2.3 These soils are found over lower ground in the south and west of the site. They comprise calcareous clay loam topsoil and subsoil, over chalk or chalk rubble at variable depth (typically between 50 and 80 cm).

2.4 An example profile is described below from a pit at observation 6 (Map 1).

0-26 cm	Dark greyish brown (2.5Y 4/2) Heavy clay loam; slightly stony (10% small rounded hard and soft chalk and 2-3% medium angular flints); moderately developed medium sub-angular blocky structure; friable; very calcareous; common fine fibrous roots; smooth clear boundary to:
26-62 cm	Olive yellow (2.5Y 6/6) medium clay loam with reddish brown (5YR 4/4) sandy inclusions; slightly stony; weakly developed fine sub-angular blocky structure; very friable; few fine fibrous roots; low packing density; very calcareous; uneven clear boundary to:
62+ cm	Hard chalk

2.5 These soils are freely-draining (Soil Wetness Class I).

### **DEEPER CLAY SOILS**

2.6 These soils are found over higher ground in the south-east of the site. They comprise calcareous clay topsoil and subsoil, mainly becoming dense, chalky and slowly permeable at depth.

2.7 An example profile is described below from a pit at observation 14 (Map 1).

0-27 cm	Dark greyish brown (2.5Y 4/2) clay; slightly stony (5% small rounded hard chalk and 5% small and medium angular flints); weakly developed coarse and very coarse sub-angular blocky structure; very firm; few fine fibrous roots; calcareous; common fine fibrous roots; smooth clear boundary to:
27-46 cm	Light yellowish brown (2.5Y 6/3) clay with 10% distinct fine yellowish brown (10YR 5/8) and 10-15% fine and medium grey (10YR 5/1) mottles; slightly

<sup>2</sup>MAFF, (1988). *Agricultural Land Classification for England and Wales: Guidelines and Criteria for Grading the Quality of Agricultural Land*.

stony; weakly developed very coarse angular blocky structure; very firm; 1-2% fine fibrous roots; no macro-pores; high packing density calcareous; smooth diffuse boundary to:

46-110 cm     Dark grey (5Y 4/1) clay with 40% diffuse yellowish brown (10YR 5/8) mottles; moderately stony (mainly small soft weathering chalk); weakly developed very coarse prismatic structure to structureless (massive); moderately strong; 1-2% no roots or macro-pores; high packing density calcareous.

2.8     These soils are imperfectly to moderately freely-draining (Soil Wetness Class III or II).

### 3.0 Agricultural land quality

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3.1 To assist in assessing land quality, the Ministry of Agriculture, Fisheries and Food (MAFF) developed a method for classifying agricultural land by grade according to the extent to which physical or chemical characteristics impose long-term limitations on agricultural use for food production. The MAFF ALC system classifies land into five grades numbered 1 to 5, with grade 3 divided into two subgrades (3a and 3b). The system was devised and introduced in the 1960s and revised in 1988.

3.2 The agricultural climate is an important factor in assessing the agricultural quality of land and has been calculated using the Climatological Data for Agricultural Land Classification<sup>3</sup>. The relevant site data for an average elevation of 90 m is given below.

- Average annual rainfall: 596 mm
- January-June accumulated temperature >0°C 1373 day°
- Field capacity period 115 days  
(when the soils are fully replete with water) early Dec-Late Mar
- Summer moisture deficits for: wheat: 112 mm  
potatoes: 105 mm

3.3 The survey described in the previous section was used in conjunction with the agro-climatic data above to classify the site using the revised guidelines for ALC issued in 1988 by MAFF<sup>4</sup>. There are no climatic limitations at this locality.

#### **SURVEY RESULTS**

3.4 The agricultural quality of the land is primarily determined by soil wetness. Land of grades 2 and 3 has been identified.

#### **Grade 2**

3.5 This grade includes land with deeper freely-draining soils (Soil Wetness Class I or II), found in valley depressions in the centre of the site (see Map 2). They are slightly limited by droughtiness (caused by slightly impeded rooting depth) and/or wetness causing occasional waterlogging at depth.

<sup>3</sup>Meteorological Office, (1989). *Climatological Data for Agricultural Land Classification*.

<sup>4</sup>MAFF, (1988). *Agricultural Land Classification for England and Wales: Guidelines and Criteria for Grading the Quality of Agricultural Land*.

### **Subgrade 3a**

- 3.6 This subgrade includes land with deeper clay soils in the south-east: the combination of high topsoil clay content and significant drainage restrictions (Soil Wetness Class III) means land access is restricted in winter and early spring, although late spring (as well as autumn) sowings are usually possible.
- 3.7 Also included are shallower soils over chalk: the restricted soil moisture reserve means average yields of cereal crop are likely to be reduced by summer droughtiness.

### **Other land (non-agricultural)**

- 3.8 This land comprises tracks and hard standings and an agricultural building.

### **Grade areas**

- 3.9 The land grades are shown on Map 2 and the areas occupied shown below.

**Table 1: Areas occupied by the different land grades**

<i><b>Grade/subgrade</b></i>	<i><b>Area (ha)</b></i>	<i><b>% of the land</b></i>
<b>Grade 2</b>	3.8	22
<b>Subgrade 3a</b>	13.1	76
<b>Other land</b>	0.3	2
<b>Total</b>	17.1	100

**APPENDIX**  
**DETAILS OF OBSERVATIONS**  
**MAPS**

**Land off Radwinter Road: Soils and ALC survey – Details of observations at each sampling point**

Obs	Topsoil			Upper subsoil			Lower subsoil			Slope	Wetness	Agricultural quality	
No	Depth (cm)	Texture	Stones >20 mm (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling	(°)	Class	Grade	Main limitation
1	0-32	HCL/ash(dist)	<5	32-50	Cchky	o	50+	Stopped		3	I	-	-
2	0-32	HCLca	5-10	32+	Chalk					4	I	3b	D
3	0-29	HCLca	<5	29-63	C	x	63-100+	Cchky	xx	4	I/II	2	D
4	0-22	C/ HCLca	5-10	22-49	chalk rubble	-	49+	Chalk		4	I	3a	D
5	0-31	Cca	5-10	31-45	Cca	xx	45-60 60+	C(brashy) Chalk	xx	1	I/II	3a	D
6	0-21	HCLca	5-10	21-42	HCL(brashy)	o	42-60 60+	C(brashy) Chalk	o	4	I	3a	D
7	0-25	HCL/Cca	5-10	25-55	Cchky	xx	55-90+	Cchky	xxx	4	II	2	W/D
8	0-26	Cca	<5	26-100+	C	o				3	I	2	D
9	0-26	Cca	5-10	26-54	Cchky	xx	54-80+	Cchky	xxx	4	II	2	W/D
10	0-32	Cca	<5	32-42	Cchky	xxx	42-100+	Cchky	xxx	3	III	3a	W
11	0-28	HCLca	<5	28-47	Cchky	xx	47-60 60+	HCL(brashy) Chalk	x	4	I	3a	D
12	0-25	Cca	<5	25-46	C	xxx	46-90+	HCL(brashy)	xx	3	III	3a	W/D
13	0-30	Cca	<5	30-46	Cchky	xx	46-100+	HCL(brashy)	xx	4	I/II	2	D
14	0-30	Cca	<5	30-90+	Cchky	xxx				3	III	3a	W/D
15	0-26	HCLca	5-10	26-50	HCLchky	xxx	50-90+	HCLchky	xxx	5	II/III	2/3a	W
17	0-31	Cca	<5	31-42	C	xxx	42-90+	Cchky	xxx	2	III	3a	W

*Gley indicators*<sup>1</sup>

o unmottled

*Slowly permeable layers*<sup>4</sup>

the top of a slowly permeable layer

the top of a layer borderline to slowly permeable

C - clay

Wetness Class<sup>5</sup>

*Limitations:*

*Suffixes & prefixes:*

o - organic

stony, chky-chalky

(vsl, sl, m, v, x)(very slightly, slightly, moderately very, extremely) calcareous

fmn - ferri-manganiferous concentrations

R – bedrock (CH – chalk, SST – sandstone)

LST – limestone, MST – Mudstone)

<sup>2</sup>Texture in accordance with particle size classes in Hodgson (1997)

<sup>3</sup> Occasionally recorded in the texture box



# KEY

- Auger observations
- Pits
- Site boundary

Client



Site:

Radwinter Road  
Saffron Walden

Map title:

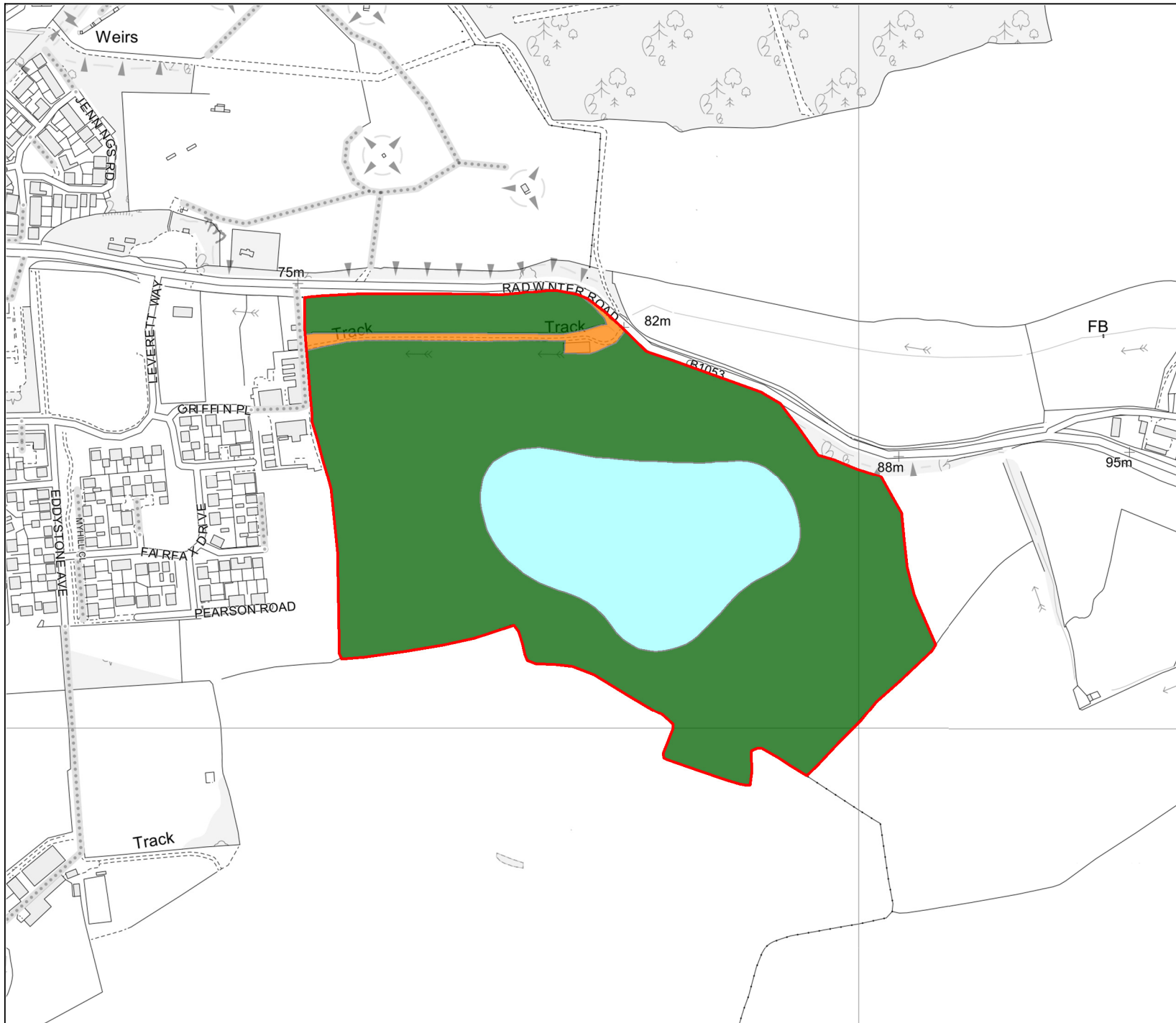
MAP 1  
Observations

**Land**  
*Research*  
ASSOCIATES

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Date: 24/02/2021

Scale: 1:5,000



#### KEY

- Grade 2
- Subgrade 3a
- Other land
- Site boundary

Client



Site:

Radwinter Road  
Saffron Walden

Map title:

MAP 2  
Agricultural Land  
Classification

**Land**  
*Research*  
**ASSOCIATES**

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