

**AGRICULTURAL QUALITY
OF LAND EAST OF COSSINGTON ROAD
SILEBY**

Report 1856/1

7th July, 2021

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**AGRICULTURAL QUALITY
OF LAND EAST OF COSSINGTON ROAD, SILEBY**

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Report 1856/1
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SUMMARY

An agricultural land quality survey has been undertaken of 8.9 ha of land east of Cossington Road, Sileby.

The site has two main soil types: loams over reddish clay and deep loams. The site is a mixture of grade 2, subgrade 3a and subgrade 3b agricultural quality, primarily limited by droughtiness and wetness.

1.0 Introduction

- 1.1 This report provides information on the agricultural quality of 8.9 ha of land east of Cossington Road, Sileby. The report is based on a survey of the land in July 2021.

SITE ENVIRONMENT

- 1.2 The site comprises one field, in arable use at the time of survey. The site is bordered to the west by Cossington Road, to the north by residential development, to the east by a railway line and to the south by farm-buildings and a brook.
- 1.3 The land is gently sloping with an average elevation of approximately 50 m AOD.

PUBLISHED INFORMATION

- 1.4 1:50,000 scale BGS information records the geology of the land as Edwalton Member mudstone, overlain by Head deposits in the south and Wanlip Member sand and gravel along the western boundary.
- 1.5 The National Soil Map (published at 1:250,000 scale) shows the site as Dunnington Heath Association soil: typically reddish coarse and fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging.¹

¹Ragg, J.M., *et al.*, (1984). *Soils and their Use in Midland and Western England*, Soil Survey of England and Wales Bulletin No. 12, Harpenden.

2.0 Soils

2.1 A detailed soil resource and agricultural quality survey was carried out in July 2021. It was based on observations at intersects of a 100 m grid, with a sampling density of one observation per hectare. During the survey, soils were examined by a combination of pits and augerings to a maximum depth of 1.0 m. A log of the sampling points and a map (Map 1) showing their location is in an appendix to this report.

LOAMY OVER REDDISH CLAYS

2.2 These soils occur predominantly in a a strip through the centre of the site. They comprise sandy clay loam topsoils with permeable upper subsoil of the same texture that overlies dense reddish clay. The subsoils are *gleyed* (greyish and ochreous coloured mottles), evidence of seasonal waterlogging to shallow depth. In the south the topsoil directly overlies dense reddish clay.

2.3 An example profile is described from a pit at observation 3 (Map 1).

0-25 cm	Dark reddish grey (5YR 4/2) sandy clay loam; slightly stony (small and medium rounded and subangular hard stones); few fine fibrous roots; moderately developed fine subangular blocky structure; friable; smooth clear boundary to:
25-61 cm	Reddish brown (5YR 5/4) sandy clay loam with 2% reddish yellow (7.5YR 7/8) mottles, pinkish grey (7.5YR 7/2) ped faces and few fine ferri-manganiferous concretions; very slightly stony (small subangular hard stones); medium packing density; moderately developed medium angular blocky structure; friable; smooth sharp boundary to:
61-100 cm+	Red (2.5YR 5/6) clay with 10% reddish yellow (7.5YR 7/8) and light reddish grey (2.5YR 7/1) mottles; stoneless; high packing density; weakly developed coarse prismatic structure; very firm.

2.4 These soils are imperfectly-draining to poorly-draining (Soil Wetness Class III/IV).

DEEP LOAMY SOILS

2.5 These soils occur in the north, east and west of the site and comprise sandy clay loam or medium sandy loam topsoil and upper subsoil that overlie sandy clay loam subsoil. In places, the subsoils show evidence of seasonal waterlogging (greyish and ochreous coloured mottles).

2.6 An example profile is described from a pit at observation 7 (Map 1).

0-28 cm	Dark reddish brown (5YR 3/3) sandy clay loam; 5% small and medium subrounded hard stones; well developed fine subangular blocky structure; friable; few very fine fibrous roots; smooth clear boundary to:
28-71 cm	Reddish brown (5YR 5/4) medium sandy loam with <1% few fine reddish yellow (7.5YR 7/8) mottles and ferri-manganiferous concretions; moderately developed medium angular blocky structure; medium packing density; firm; 5% small and medium hard rounded stones; smooth gradual boundary to

71-100 cm+ Reddish brown (5YR 5/2) sandy clay loam with 4% fine reddish yellow (7.5YR 6/8) and pinkish grey (7.5YR 7/2) mottles; 10% small rounded hard stones; moderately developed medium subangular blocky structure; medium packing density; friable.

2.7 These soils are freely-draining (Soil Wetness Class I or II).

3.0 Agricultural land quality

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 Classification². The relevant site data for an average elevation of 50 m is given below.

- Average annual rainfall: 639 mm
- January-June accumulated temperature >0°C 1407 day°
- Field capacity period 148 days
(when the soils are fully replete with water) late Nov – mid Apr
- Summer moisture deficits for: wheat: 109 mm
potatoes: 101 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 MAFF³. There are no climatic limitations at this locality.

SURVEY RESULTS

3.4 The agricultural quality of the land is determined by droughtiness and wetness. Other potentially limiting factors have been assessed, but do not affect the land grading.

3.5 Land of grade 2 and 3 has been identified.

Grade 2

²Meteorological Office, (1989). *Climatological Data for Agricultural Land Classification*.

³MAFF, (1988). *Agricultural Land Classification for England and Wales: Guidelines and Criteria for Grading the Quality of Agricultural Land*.

3.6 This land grade comprises the deep loamy soils in the east and west of the site. They are slightly limited by droughtiness, as the subsoils store below optimum moisture for crop uptake in dry years under the local climate.

3.7 Where the deep loamy soils have gleyed subsoils, they are limited by wetness: The moderate clay content of the topsoils and slightly impeded drainage (Soil Wetness Class II) means access with farm machinery is usually not possible in winter, which can restrict the flexibility of some cropping.

Subgrade 3a

3.8 This land grade occurs across the centre of the site where the loamy soils overlie reddish clay at depth. The combination of moderately high topsoil clay content and impeded drainage (Soil Wetness Class III) means access with farm machinery is not usually possible in winter and early spring, although late spring and autumn cultivation is possible in most years.

Subgrade 3b

3.9 This subgrade comprises land formed of heavy reddish clays along the southern boundary of the site. The combination of moderately high topsoil clay content and poor drainage (Soil Wetness Class IV) means that land access with machinery is not possible in winter and spring. Arable land use is mainly restricted to autumn-sown combinable crops.

Grade areas

3.10 The boundaries between the different grades of land are shown on Map 2 and the areas occupied by each are shown below.

Table 1: Areas occupied by the different land grades

<i>Grade/subgrade</i>	<i>Area (ha)</i>	<i>% of the land</i>
Grade 2	5.9	66
Subgrade 3a	2.4	27
Subgrade 3b	0.6	7
Total	8.9	100

APPENDIX

MAPS AND DETAILS OF OBSERVATIONS

Land east of Cossington Road, Sileby: ALC and soil resources survey – Details of observations at each sampling point

Obs No	Topsoil			Upper subsoil			Lower subsoil			Slope (°)	Wetness Class	Agricultural quality	
	Depth (cm)	Texture	Stones >20 mm (%)	Depth (cm)	Texture and stoniness	Mottling	Depth (cm)	Texture and stoniness	Mottling			Grade	Main limitation
1	0-24	SCL	<5	24-40+	MSL	x				2	I	2	D
2	0-20	SCL	<5	20-40+	MSL	xx				2	I	2	D
3	0-25	SCL	<5	25-61	SCL	xxx	<u>61-100+</u>	Cr	xxx	2	III	3a	W
4	0-30	SCL	<5	30-41	SCL	xxx	<u>41-94+</u>	Cr	xxx	2	III	3a	W
5	0-27	SCL	<5	27-40+	MSL mod st	xx	40+	Stopped on stone		2	I	2	D
6	0-30	SCL	<5	30-65	SCL	xx(x)	65+	Stopped on stone		0	II	2	W
7	0-28	SCL	<5	28-71	MSL	xx	71+	Stopped on stone		0	I	2	D
8	0-30	SCL	<5	30-90+	Cr	xx				0	IV	3b	W
9	0-28	SCL	<5	28-36	SCL	x	<u>36-60+</u>	Cr	xxx	0	III	3a	W

Key to table

*Gley indicators*¹

- o unmottled
- x a few ochreous mottles (or a few to common root mottles (topsoils))³
- xx common to many ochreous mottles and/or dull structure faces (slightly gleyed horizon)
- xxx greyish or pale matrix common to many ochreous mottles (gleyed horizon)
- xxxx dominantly grey or blueish matrix often with some ochreous mottles (gleyed horizon)

*Slowly permeable layers*⁴

- a depth underlined (e.g. 50) indicates the top of a slowly permeable layer
- A wavy underline (e.g. 50) indicates the top of a layer borderline to slowly permeable

*Texture*²

- C - clay
- ZC - silty clay
- SC - sandy clay
- CL - clay loam (H-heavy, M-medium)
- ZCL - silty clay loam (H-heavy, M-medium)
- SZL - sandy silt loam (F-fine, M-medium, C-coarse)
- LS - loamy sand (F-fine, M-medium, C-coarse)
- SL - sandy loam (F-fine, M-medium, C-coarse)
- S - sand (F-fine, M-medium, C-coarse)
- SCL - sandy clay loam
- P - peat (H-humified, SF-semi-fibrous, F-fibrous)
- LP - loamy peat; PL - peaty loam

*Wetness Class*⁵

I-VI

Limitations:

- W - wetness/workability
 - D - droughtiness
 - De - depth
 - F - flooding
 - St – stoniness
 - SI – slope
 - T – topography/microrelief
- Suffixes & prefixes:*
- r-reddish, gn – greenish
 - o - organic
 - (v)st – (very) stony, chky-chalky
 - ca – calcareous: x-extremely, v-very, sl-slightly

Other abbreviations

- fmn - ferri-manganiferous concentrations
- dist - disturbed soil layer;
- R – bedrock (CH – chalk, SST – sandstone)
- LST – limestone, MST – Mudstone)

¹Gley indicators in accordance with Hodgson, J.M., 1997. Soil Survey Field Handbook (third edition). Soil survey technical monograph No. 5

²Texture in accordance with particle size classes in Hodgson (1997)

³Occasionally recorded in the texture box

⁴Permeability is estimated for auger borings and must be confirmed by full pit observations in accordance with the definitions in Hodgson (1984)

⁵These classes are defined in Hodgson (1997)



KEY

-  Auger observation
-  Soil/land grade description pit
-  Survey area

Client:

David Wilson Homes

Site:

**Land east of Cossington Road,
Sileby**

Map title:

**Map 1
Survey observations**



Scale: 1:3,000

Date: 07/07/2021

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KEY

-  Grade 2
-  Subgrade 3a
-  Subgrade 3b
-  Survey area

Client:
David Wilson Homes

Site:
**Land east of Cossington Road,
Sileby**

Map title:
**Map 2
Agricultural Land Classification**



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Scale: 1:3,000

Date: 07/07/2021