

AGRICULTURAL LAND CLASSIFICATION

North Wales Construction Limited

**Former Rugby Union Club
Near Rhuddlan**



Our Ref: SES/NWCL/FRUCR/#1

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Client:

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AGRICULTURAL LAND CLASSIFICATION

**Former Rugby Union Club
Near Rhuddlan**

A report prepared on behalf of *Soil Environment Services* by:



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1. INTRODUCTION

An Agricultural Land Classification (ALC)¹ has been carried out on 4.6 ha of land located at the Former Rugby Union Club near Rhuddlan (Drawing ALC/1). The site is centred on OS Grid Ref. 304758, 376804.

Agricultural land is classified into the following grades according to the 1988 guidelines¹.

Grade	Description
1	Excellent quality agricultural land with no or very minor limitations to agricultural use.
2	Very good quality agricultural land with minor limitations which affect crop yield, cultivation or harvesting.
3a	Good quality agricultural land capable of producing moderate to high yields of a narrow range of arable crops or moderate yields of a wider range of crops.
3b	Moderate quality agricultural land capable of producing moderate yields of a narrow range of crops or lower yields of a wider range of crops.
4	Poor quality agricultural land with severe limitations which significantly restrict the range of crops and/or level of yields.
5	Very poor quality agricultural land with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

The survey was conducted on the 21st August 2019 and classifies the land into one or more of the above grades.

On the survey date the majority of the site was in recently cut grass (used as Rugby pitches).

Statement of competence

The survey was undertaken by Rebecca Jordan BSc MSc, an Environmental Consultant who is a member of BSSS with 3 years ALC survey experience and has attended the *Agricultural Land Classification: England and Wales Training Event* (November 2018) and the *Introduction to Soil Classification Training Event* (June 2016) organised by BSSS. The report was checked by Dr Robin Davies who has been a member of the BSSS for over 30 years, the IPSS since it was formed in 1991 and has been undertaking ALC surveys for 25 years.

2. METHODOLOGY

The classification includes an initial desktop investigation to examine previously mapped soil types and to note the drift and solid geology. This included consultation from:

Soil Survey of England and Wales 1:250 000⁴
British Geological Survey 1:50 000 solid and drift map⁸

The field survey consisted of hand auger borings to a depth of 1.2 m (where possible) to examine soil profiles on a 100 m grid (1 boring per hectare) using standard soil survey methods². Pit excavations were conducted to determine sub soil structure where necessary. This data was used to map the principal soil types for determining the ALC. The soil removed during augering and pit excavations was examined in accordance with:

Soil Survey Field Handbook²
Describing and Sampling Soil Profiles
Soil Survey of England and Wales, Technical Monograph No. 5, 1976

Soil Classification for Soil Survey⁹
Monographs on Soil Survey
Butler, B E (1980) Clarendon Press, Oxford

Climatological data³ was used to determine the overriding site limitation and for interaction with soil parameters (Appendix A). The above information was cross referenced with geological surveys⁸, previous soil surveys¹⁰ and the national 1:250 000 series ALC survey⁴ relevant for this site to substantiate the findings. The ALC grade was then determined for this site and for the current survey and is detailed in Drawing ALC/1.

3. BASELINE CONDITIONS

3.1. Climate and flooding

The climatological data (Table 1) indicates above average temperature, below average rainfall and a below average number of field capacity days for the region.

Factor	Units	Value
Altitude AOD	m	30
Accumulated temperature	day°C (Jan-June)	1437.9
Average Annual Rainfall	mm	703.9
Field Capacity Days	days	169.2
Moisture Deficit Wheat	mm	102.0
Moisture Deficit Potatoes	mm	93.7

The site is not mapped within a flood risk area⁷.

3.2. Soils, geology and topography

3.2.1. Soils

The site has previously been mapped as having soils of the *Salop Association*^{4,5}, with soils of the *Newport Association*^{4,5} mapped to the north of the site.

One general soil type was noted for the purposes of ALC grading.

This study has identified the soils to be clay loams over clay to depth.

3.2.2. Geology⁸

Superficial Geology

Majority of the site:

1:50 000 scale superficial deposits description: Till, Devensian - Diamicton. Superficial Deposits formed up to 2 million years ago in the Quaternary Period. Local environment previously dominated by ice age conditions (U).

East of the site:

1:50 000 scale superficial deposits description: Glaciofluvial Deposits, Devensian - Sand And Gravel. Superficial Deposits formed up to 2 million years ago in the Quaternary Period. Local environment previously dominated by ice age conditions (UGF).

Bedrock Geology

1:50 000 scale bedrock geology description: Warwickshire Group - Mudstone, Siltstone And Sandstone. Sedimentary Bedrock formed approximately 272 to 318 million years ago in the Permian and Carboniferous Periods. Local environment previously dominated by rivers.

3.2.3. Topography

The slope measured on site was a maximum of 3° and hence gradient will not limit the ALC Grade for the site.

No significant variation in microrelief was noted on the site.

4. FIELDWORK RESULTS

4.1. Descriptions of soil types

The soils across the site were noted as clay loams over clay to depth. Full profile data is listed in Appendix B.

A summary of the features of the soil type/s are listed in Table 2 and locations are shown within Drawing ALC/1.

Table 2. Soil Type descriptions			
Profile	Soil types		
Description	Type 1		
Horizon 1 (topsoil)	0-40 cm Brown (7.5YR 4/3) very slightly stony clay loam, no mottles; firm weak medium subangular blocky structure.		
Horizon 2 (subsoil 1)	40-70 cm Brown (10YR 5/3) stoneless clay loam, few fine ochreous mottles; firm weak medium angular blocky structure.		
Horizon 3 (subsoil 2)	70-120 cm Brown (7.5YR 5/4) stoneless clay, many medium ochreous mottles; firm moderate medium prismatic structure.		
Survey points (Drawing ALC/1) and soil types: Borings/ Trial Pits Type 1 soil = 1-6 Notes:			

4.2. Field study photographs

Photo 1. Boring location 3 – Profile of Soil Type 1



NB Photographs of auger borings are included for an illustration of horizons, to verify profile depth and provide an indication of colour but are not intended to verify any structure.

Photo 2. Pit 4 – Soil Type 1



4.3. In-field wetness class assessment

An in-field wetness assessment was conducted for the soil types (Table 3).

Table 3. In-field Wetness Class Assessment						
Soil Type	Feature	Parameters	Findings	WC		
1	Site conditions	Undisturbed/ disturbed	Undisturbed	III		
		FCD	169.2			
	Potential Slowly Permeable Layer (SPL)	Horizon depth (cm)	40-70			
		Texture	CL			
		Structure	FWMAB			
		Biopores > 0.5 mm (%)	< 0.5			
		Evidence of wetness	Mottles			
	Potential Gleyed Horizon	Matrix colour	Pale – 10YR 5/3			
		Ped faces colour	Pale – 10YR 5/3			
		Mottles	Ochreous – 10YR 5/6			
		Depth to gleying (cm)	40			
	Reference in ALC guidelines – Figure 8					
	<p>Key FCD – Field Capacity Days CL – Clay Loam WC – Wetness Class FWMAB – Firm Weak Medium Angular Blocky</p> <p>Notes:</p>					

5. AGRICULTURAL LAND CLASSIFICATION

5.1. National 1:250 000 map grading

Grading on the Predictive ALC Map⁶ indicates **ALC Grade 4** across the site.

5.2. Current grading

This survey has resulted in an Agricultural Land Classification of the following grades (Drawing ALC/1):

Grade	Area		Limitation
1			
2			
3a	3.8 ha	82.6%	Type 1 Soils – Wetness Limitation
3b			
4			
5			
Non-agricultural land	0.8	17.4%	Hardstanding, access track and pond
Total	4.6 ha	100%	

Type 1 Soils – Wetness Limitation

The combination of the topsoil texture (medium clay loam), Wetness Class (III) and the number of Field Capacity Days (169.2) results in ALC Grade 3a for Type 1 soils.

6. MITIGATION

This development results in a loss of a fraction of a percent of the BMV land in this area which includes Grades 1 and 2 in addition to the large area of 3a

Within a 5 square mile area all land is BMV grade with about 10% of this Grades 1 and 2.

Hence the loss of the lower grade BMV land amounts to 0.65% loss in the immediate area.

The impact would therefore be considered to be LOW.

DRAWING ALC/1

ALC Grade

Soil Environment Services

Key

-  Good Quality – 3a
-  Non Agricultural
-  Boring Location
-  Pit Location

Drawing Title: ALC Grade

Drawing No.: ALC/1

Scale: 1:2867

Date: 21/08/2019



APPENDIX A

Climatological data for
Agricultural Land Classification

Droughtiness (moisture balance) determination for each soil type and restored profile

Moisture availability data for each texture from MAFF ALC Guidelines 1988

Moisture Balance (MB) = AP - MD for wheat and potatoes (adjusted for stones)

	Horizon	Type 1		Type 2		Type 3	
		texture	water	texture	water	texture	water
TAvt - Topsoil water available (mm)		CL	17.15	0	0.00	0	0.00
LTt - Topsoil thickness (cm)		0	40.00	0	0.00	0	0.00
TAVs - Subsoil total available	1	CL	16.00	0	0.00	0	0.00
	2	C	13.00	0	0.00	0	0.00
	3	0	0.00	0	0.00	0	0.00
	4	0	0.00	0	0.00	0	0.00
EAVs - Subsoil (SS) easily available	1	CL	10.00	0	0.00	0	0.00
	2	C	7.00	0	0.00	0	0.00
	3	0	0.00	0	0.00	0	0.00
	4	0	0.00	0	0.00	0	0.00
LT50 - Thickness ss layers to 50cm	1	CL	10.00	0	0.00	0	0.00
	2	C	0.00	0	0.00	0	0.00
	3	0	0.00	0	0.00	0	0.00
	4	0	0.00	0	0.00	0	0.00
LT120 - Thickness ss layers 50 to 120cm	1	CL	20.00	0	0.00	0	0.00
	2	C	50.00	0	0.00	0	0.00
	3	0	0.00	0	0.00	0	0.00
	4	0	0.00	0	0.00	0	0.00
LT0 - Thickness ss layers to 70cm	1	CL	30.00	0	0.00	0	0.00
	2	C	0.00	0	0.00	0	0.00
	3	0	0.00	0	0.00	0	0.00
	4	0	0.00	0	0.00	0	0.00
Total profile thickness for soil type cm		0	120	0	0	0	0

SOIL Droughtiness (moisture balance) results

Type 1

Grade

Results

AP wheat = 139.6
 Moisture balance wheat = 37.6 1
 AP potatoes = 116.6
 Moisture balance potatoes = 23.9 1



Notes

ALC Grade	Moisture Balance Limits	
	wheat	potatoes
1	30	10
2	5	-10
3a	-20	-30
3b	-50	-55
4	<-50	<-55

APPENDIX B

Site Survey Field Notes

Boring no.	Topsoil						Subsoil 1						Subsoil 2					
	Depth (cm)	Texture	Colour (Munsell)	Stoniness (%)	Mottles	Structure	Depth (cm)	Texture	Colour (Munsell)	Stoniness (%)	Mottles	Structure	Depth (cm)	Texture	Colour (Munsell)	Stoniness (%)	Mottles	Structure
1	0-40	CL	7.5YR 4/3	4	No	FWMSAB	40-75	CL	10YR 5/3	1	FFO	FWMAB	75-120	C	7.5YR 5/4	2	MMO	FMMP
2	0-38	CL	7.5YR 4/3	3	No	FWMSAB	38-70	CL	10YR 5/3	0	FFO	FWMAB	70-120	C	7.5YR 5/4	0	MMO	FMMP
3	0-40	CL	7.5YR 4/3	5	No	FWMSAB	40-70	CL	10YR 5/3	0	FFO	FWMAB	70-120	C	7.5YR 5/4	0	MMO	FMMP
4	0-40	CL	7.5YR 4/3	5	No	FWMSAB	40-70	CL	10YR 5/3	0	FFO	FWMAB	70-120	C	7.5YR 5/4	0	MMO	FMMP
5	0-42	CL	7.5YR 4/3	6	No	FWMSAB	42-80	CL	10YR 5/3	0	FFO	FWMAB	80-120	C	7.5YR 5/4	1	MMO	FMMP
6	0-40	CL	7.5YR 4/3	5	No	FWMSAB	40-70	CL	10YR 5/3	1	FFO	FWMAB	70-120	C	7.5YR 5/4	0	MMO	FMMP

Key:

CL - Clay Loam

C - Clay

No - No Mottles

FFO - Few Fine Ochreous

MMO - Moderate Massive Ochreous

FWMSAB - Firm Weak Medium Subangular Blocky

FWMAB - Firm Weak Medium Angular Blocky

FMMP - Firm Moderate Medium Prismatic

INFORMATION SOURCES

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