STATEMENT OF PHYSICAL CHARACTERISTICS AND AGRICULTURAL LAND CLASSIFICATION CADEBY QUARRY, CONISBROUGH SOUTH YORKSHIRE PROPOSED QUARRY EXTENSION NOVEMBER 1992

ADAS
Leeds Statutory Group

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SUMMARY

An Agricultural Land Classification survey of approximately 8.4ha of land at Cadeby was carried out in November 1992.

7.21ha of this was in agricultural use of which 5.22ha falls within Grade 1. Soil profiles are deep (110cm or more in most cases) and well drained, falling in Wetness Class I. Topsoils and subsoils are light to medium-textured (generally sandy loam, sandy silt loam, sandy clay loam or medium silty clay loam) and stoneless to very slightly stony. This land has no or very minor limitations to agricultural use.

Grade 2 land occurs in three separate areas (totalling 1.05ha) in the west of the site. Profiles are well drained (falling in Wetness Class I) and typically consist of light to medium-textured topsoils and subsoils overlying limestone bedrock at between 70cm and 100cm depth. Slight soil droughtiness is the factoring limiting ALC grade in this case. Subgrade 3a land covers a total of 0.94ha and occurs in two separate areas. Profiles are well-drained (falling in Wetness Class I) and consist of light to medium-textured topsoils and subsoils overlying limestone bedrock at between 40cm and 60cm depth. Soil droughtiness is, therefore, the factor limiting the ALC grade of this land.

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1. INTRODUCTION AND STATEMENT OF PHYSICAL CHARACTERISTICS

1.1 Location and Survey Methods

The site lies 6Km south west of Doncaster town centre and is centred on Grid Reference SE 523008. Survey work was carried out in November 1992 when soils were examined by hand auger borings at 50m intervals predetermined by the National Grid. Two soil pits were dug to allow the assessment of subsoil structure and to allow samples to be taken for laboratory analysis. Land quality was assessed using the methods described in "Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land". (MAFF, 1988)

1.2 Land Use and Relief

At the time of survey, 86% of the site was in arable use. The remainder consisted of a small area of farm woodland detached from the main site, and part of the existing quarry.

Site altitude varies from approximately 67m AOD to 75m AOD and the land is very slightly sloping (typically 0-2°) with an easterly aspect.

1.3 Climate

Grid Reference	:	SE 523008
Altitude (m)	:	70
Accumulated Temperature above 0°C (January-June)	:	1348 day°C
Average Annual Rainfall (mm)	:	610
Climatic Grade	:	1
Field Capacity Days	:	128
Moisture Deficit (mm) Wheat	:	103
Moisture Deficit (mm) Potatoes	:	94

1.4 Geology, Soils and Drainage

The area is underlain by deposits of Lower Magnesian Limestone which occur within 1m of the surface in parts of the site. Soils are formed on loamy material derived from weathering of the limestone. Profiles are well drained, falling in Wetness Class I. Topsoils and subsoils are generally light to medium-textured, typically consisting of sandy loam, sandy silt loam, sandy clay loam or medium clay loam.

1.5 Soil Properties

Two main soil types occur on this site, descriptions of which are given below. Topsoil and subsoil resources are also shown on the accompanying maps along with soil thickness and volume information.

(a) Soil Type 1:- Deep light to medium textured soils (Unit T1/SIA)
(Full Profile Description, Table 1)

This soil over limestone occurs in the east and west of the site. It is characterised by deep, well-drained profiles formed in light to medium textured material derived from weathered loamy marl beds within the limestone.

(b) Soil Type 2:- Shallow light to medium textured soils (Unit T1/51B)
(Full Profile Description, Table 2)

This soil, formed on limestone, occurs in the south and west of the site. It is characterised by being well drained, profiles passing to limestone bedrock at between 40cm and 80cm depth.

1.6 Soil Resources

(i) Topsoils

Unit T1 occurs over the whole site. It is light to medium-textured and consists of sandy loam, sandy silt loam or medium silty clay loam which is stoneless to slightly stony (typically around 2-4% small and medium subrounded limestones, rising to 8% in places). It has a moderately to well-developed fine subangular blocky structure. Median unit thickness is 30cm.

(ii) Subsoils

Unit SIA occurs over most of the site. It is light to medium-textured, consisting of sandy loam, sandy silt loam, sandy clay loam or medium silty clay loam. This unit is very slightly stony and typically contains 2-4% small and medium subrounded limestones. It has a well-developed fine to medium angular blocky structure. Mean thickness is 70cm.

Unit SIB occurs in the south and west of the site. It is very similar to Unit SIA but mean thickness is only 35cm, with weathering limestone bedrock occurring at between 40cm and 70cm depth.

(iii) Notes on differentiation of subsoil material from overburden

(a) Subsoils are brown or yellowish brown in colour and contain relatively little stone - typically 0-20%.

(b) Overburden consists mainly of weathering limestone blocks varying from small to very large in size in a matrix of a little brown subsoil material and white rock flour.

(c) The higher quality land (Grades 1, 2, 3a) will always contain an appreciable depth of subsoil material often to a depth of 50-100cm from the surface. This should be stripped and stored separately from the topsoil and overburden.

(d) Poorer quality land (Subgrade 3b on this site) will often consist of topsoil directly overlying overburden.

2. SOIL PROFILE DESCRIPTIONS

Table 1

Soil Type 1 (T1/SIA) Land Use: Arable Slope: 0°

Depth (cm)	Description
0.30	Dark brown (10YR 3/3) fine sandy loam; no mottles; stoneless; moist; moderately developed fine to medium subangular blocky structure; friable; very slightly porus; few fine and medium fibrous roots; slightly sticky; slightly pastic; non-calcareous; abrupt smooth boundary.
30-55	Brown (7.5YR 4/4) fine sandy loam; no mottles; stoneless; moist; moderately developed fine to medium subangular blocky structure; firm soil strength; few fine fibrous roots; slightly sticky; slightly pastic; non-calcareous; abrupt smooth boundary.
55-120	Yellowish brown (10YR 5/4) fine sandy loam; no mottles; stoneless; moist; moderately developed meium angular blocky structure; firm soil strength; few medium fibrous roots; slightly sticky; slightly pastic; non-calcareous.

Table 2

Soil Type 2 (T1/S1B) Lland Use: Quarry Face Slope 0°

Depth (cm)	Description
0.25	Dark brown (10YR 4/3) fine sandy loam; no mottles; very slightly stony (approx 1% small subrounded soft limestones); moist; moderately to well developed fine subangular blocky structure; friable; slightly porous; many fine and medium fibrous roots; slightly sticky; slightly pastic; slightly calcareous; clear wavy boundary.
25–35	Dark brown (7.5YR 4/2) medium clay loam; common indistinct dark brown (7.5 YR 4/4) mottles; very slightly stony (approximately 2% small to medium subrounded soft limestones); moist; well developed fine subangular blocky structure; friable; slightly porous; common fine fibrous roots; moderately sticky; moderately plastic; slightly calcareous; clear irregular boundary.
35–65	Brown (7.5YR 5/3) fine sandy silt loam; few indistinct reddish yellow (7.5YR 6/6) mottles; very slightly stony (approximately 2% small to medium subrounded soft limestones); moist; well developed medium angular blocky structure; friable; slightly porous; common fine fibrous roots; moderately sticky; moderately plastic; slightly calcareous; smooth sharp boundary.
65+	Weathering limestone bedrock; few fine fibrous roots to 85cm.

3. AGRICULTURAL LAND CLASSIFICATION

The ALC grades occurring on this site are as follows:-

Grade/Subgrade	Hectares	Percentage of Total Area
1	5.22	62.3
2	1.05	12.5
3a	0.94	11.2
3b		
4		
5		
(Subtotal)	(7.21)	(86.0)
Urban	0.41	5.9
Non Agricultural		
Woodland - Farm	0.68	8.1
- Commercial		
Agricultural Buildings		
Open Water		
Land not surveyed		
(Subtotal)		
TOTAL	8.38	100

3.1 Grade 1

Grade 1 land occurs in two separate areas - one in the west of the site and one in the centre and east. Profiles are deep and well drained, falling in Wetness Class I. Topsoils and subsoils are generally light or medium-textured (consisting of sandy loam, sandy silt loam, sandy clay loam or medium silty clay loam) and stoneless to very slightly stony. This land has no or very minor limitations to agricultural use.

3.2 Grade 2

Grade 2 land occurs in three separate areas in the west of the site. The topsoils are light to medium-textured (generally medium sandy loam or medium silty clay loam) and overlie light to heavy-textured subsoils (consisting of sandy loam or sandy clay loam in the two most westerly areas and heavy silty clay loam in the most easterly area). Profiles are well-drained (falling in Wetness Class I) and stoneless to very slightly stony, with weathering limestone bedrock occurring at between 70cm and 90cm depth. Slight soil droughtiness is, therefore, the factor which limits this land to Grade 2.

3.3 Subgrade 3a

Land in this subgrade occurs in two separate areas in the north and east of the site. Profiles are well-drained (falling in Wetness Class I) and typically consist of sandy loam or medium silty clay loam topsoils overlying sandy clay loam or medium silty clay loam subsoils. Profiles are very slightly to slightly stony (typically 4.8% small and medium subrounded limestones). Weathering limestone bedrock occurs at between 40cm and 60cm depth and soil droughtiness is, therefore, the factor limiting this land to Subgrade 3a.

Urban

This refers to an area in the south-east of the site, adjoining the existing quarry, where the topsoil and upper subsoil have already been removed.

Farm Woodland

This occurs in a small detached area in the south-east.

MAPS