MAFF Ministry of Agriculture Fisheries and Food

STATEMENT OF PHYSICAL CHARACTERISTICS AND AGRICULTURAL LAND CLASSIFICATION STAIRFOOT QUARRY SOUTH YORKSHIRE *AUGUST 1995*

ADAS
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SUMMARY

A detailed Agricultural Land Classification (ALC) and Statement of Physical Characteristics survey of 2.5 ha of land at Stairfoot Quarry was carried out in August 1995. At the time of the survey all of the land was in agricultural use and all falls in Subgrade 3b. The soils in the north of the site are well drained and consist of slightly stony medium silty clay loam or medium sandy silt loam topsoils overlying weathering sandstone at around 30 cm depth. Soil droughtiness limits this land to Subgrade 3b. In the south of the site the soils are poorly drained and consist of heavy silty clay loam topsoils overlying gleyed and slowly permeable heavy silty clay loam or silty clay subsoils at around 30 cm depth. Soil wetness and topsoil workability limitations are the factors limiting the land to Subgrade 3b.

The soil resources consist of a median depth of 30 cm of light to medium-textured slightly stony topsoils in the north of the site, and a similar depth of heavy-textured slightly stony topsoils in the south. There are no subsoil resources in the north (where weathering sandstone outcrops) whilst in the south heavy-textured subsoils extend to 120 cm depth from the soil surface.

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STATEMENT OF PHYSICAL CHARACTERISTICS AND AGRICULTURAL LAND CLASSIFICATION REPORT ON THE PROPOSED EXTENSION TO STAIRFOOT QUARRY, SOUTH YORKSHIRE

1. INTRODUCTION AND STATEMENT OF PHYSICAL CHARACTERISTICS

1.1 Location and Survey Methods

The proposed extension lies approximately 4 km south-east of Barnsley, and around Grid Reference SE 383049. Survey work was carried out in August 1995 when the soils were examined by hand auger borings at 100m intervals predetermined by the National Grid. In addition, two soil pits were dug to allow full profile descriptions to be made. The 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 the survey the whole site was in cereal stubble.

Site altitude varies from 60m AOD in the north to 50m AOD in the south and the land is gently to moderately sloping (2-5°) with a south-westerly aspect.

1.3 Climate

Grid Reference	: SE383049
Altitude (m)	: 55
Accumulated Temperature above 0°C (January - June)	: 1366 day °C
Average Annual Rainfall (mm)	: 620
Climatic Grade	: 1
Field Capacity Days	: 141
Moisture Deficit (mm) Wheat	: 105
Moisture Deficit (mm) Potatoes	: 96

1.4 Geology, Soils and Drainage

The site is underlain by Carboniferous Coal Measures consisting of interbedded sandstones and shales. With the exception of locally derived Head deposits there is no drift cover on the site and the soils have formed in weathering sandstone (in the north) or shale (in the south).

The soils in the north are well drained (Wetness Class I) and consist of medium sandy silt loams or medium silty clay loams overlying weathering sandstone at around 30cm depth. The soils in the south of the site are poorly drained (Wetness Class IV) and consist of heavy silty clay loam topsoils overlying gleyed and slowly permeable heavy silty clay loam or silty clay subsoils which extend to depth. The soils correspond to the Dale Association as mapped by the Soil Survey and Land Research Centre.

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:- Heavy-textured soils (Unit T1/S1)
(Full Profile Description, Table 1).

This soil, formed in Coal Measures shales, occurs in the south of the site. It is characterised by a deep heavy silty clay loam or silty clay subsoil.

(b) Soil Type 2:- Light to Medium textured soils (Unit T2/Sandstone)
(Full Profile Description, Table 2).

1.6 Soil Resources

(i) Topsoils

Unit T1 is found in the south of the site and is heavy textured (heavy silty clay loam) and slightly stony, with around 7% very small to medium angular and subangular sandstones. Unit T1 has a moderately developed coarse subangular blocky structure and a median depth of 30cm. It overlies subsoil unit S1.

Unit T2 occurs in the north of the site. It is light to medium-textured (medium sandy silt loam or medium silty clay loam) and slightly stony, with around 12% very small to medium angular and subangular sandstones. It has a moderately developed medium and coarse subangular blocky structure, a median depth of 30cm and directly overlies weathering sandstone.

(ii) Subsoils

Unit S1 occurs in the south of the site, underlying topsoil Unit T1. It is heavy-textured, consisting of heavy silty clay loam or silty clay, and stoneless to slightly stony, with up to 15% very small to large angular and subangular sandstones. It has a weakly to moderately developed coarse subangular blocky, medium prismatic or coarse prismatic structure and a mean unit depth of 90cm.

2. SOIL PROFILE DESCRIPTIONS

Table 1 Heavy-textured soil, T1/S1

Profile Pit 1 (Near auger boring 2)

Slope:- 2° SW
Land Use:- Cereal Stubble
Weather:- Hot and dry

Depth cm	Horizon	Description
0-30		Very dark greyish brown (2.5Y3/2) heavy silty clay loam; no mottles; slightly stony, with around 8% very small to medium angular and subangular sandstones; dry; moderately developed coarse subangular blocky structure; very hard; slightly porous; many fine and very fine fibrous roots; moderately sticky; moderately plastic; non-calcareous; clear smooth boundary.
30-45		Greyish brown (10YR5/2) heavy silty clay loam; common distinct strong brown (7.5YR5/8) and indistinct light grey (2.5Y7/2) mottles; slightly stony, with around 8% very small to medium angular and subangular sandstones; dry; weakly developed coarse subangular blocky and medium prismatic structure; moderately hard; slightly porous (<0.5% pores > 0.5mm); common very fine fibrous roots; moderately sticky; moderately plastic; non-calcareous; clear smooth boundary.
45-120		Light grey (5Y7/1) silty clay; many distinct strong brown (7.5YR5/8) and common distinct reddish yellow (7.5YR6/8) mottles; stoneless; slightly moist; moderately developed medium and coarse prismatic structure; extremely hard, very slightly porous (<0.5% pores >0.5mm); few very fine fibrous roots; very sticky; very plastic; non-calcareous.

Table 2 Light to medium-textured soil, T2/Sandstone.

Profile Pit 2 (Near auger boring 1)

Slope:- 2° SW
Land Use:- Cereal Stubble
Weather:- Hot and dry

Depth cm	Horizon	Description
0-31		Very dark greyish brown (2.5Y3/2) medium silty clay loam; no mottles; slightly stony, with around 12% very small to medium angular and subangular sandstones; dry; moderately developed medium and coarse subangular blocky structure; slightly hard; moderately porous; many very fine fibrous roots; slightly sticky; slightly plastic; non-calcareous; clear smooth boundary.
31+		Weathering sandstone.

3. AGRICULTURAL LAND CLASSIFICATION

The ALC grades occurring on this site are as follows:

Grade/Subgrade	Hectares	Percentage of Total Area
1		
2		
3a		
3b	2.5	100.0
4		
5		
(Sub total)	(2.5)	(100.0)
Urban		
Non Agricultural		
Woodland - Farm		
- Commercial		
Agricultural Buildings		
Open Water		
Land not surveyed		
(Sub total)		
TOTAL	2.5	100

3.1 Subgrade 3b

All of the site falls in Subgrade 3b. In the north the soils are well drained (Wetness Class I) and light to medium-textured topsoils overlie weathering sandstone at around 30cm depth. Soil droughtiness limits this land to Subgrade 3b. In the south heavy-textured topsoils overlie gleyed and slowly permeable heavy-textured subsoils at around 30cm depth. These soils are poorly drained, falling in Wetness Class IV, and the grade of the land is limited by soil wetness and topsoil workability restrictions.

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MAPS