

A SOIL REPORT FOR PROPOSED SAND AND GRAVEL QUARRY, SHOBDON, LEOMINSTER

Introduction

This 19.84 hectare site lies at the southern end of Shobdon Airfield, about 9 km west of Leominster and 1 km south of Shobdon village. The site is part of a larger level, outwash plain at an altitude of about 90 m. This outwash plain is sandwiched between higher ground to the north and the River Arrow to the south. The southwest corner of the site adjoins Shobdon Marsh from which the Pinsley Brook drains east to join the River Lugg at Leominster. The northern side boundary encroaches onto the perimeter of the airfield beyond the trees which screen all sides of the site. The site is surrounded by open countryside, most of which is under intensive agricultural and horticultural production.

The area received an annual average rainfall of about 780 mm and has a mean accumulated temperature above 0°C, January to June (ATO), of 1408. Rainfall is relatively evenly distributed throughout the year though there is a slightly drier period from February to June. The balance between summer rainfall and evapotranspiration creates a moisture deficit of 93 mm for wheat and 82 mm for potatoes. There is a slight, but measurable trend towards warmer and drier conditions moving from west to east, away from the higher ground of Shobdon Hill Wood (317 m) towards the Arrow valley at 90 m. There is no overall or local climate restrictions to the agricultural use of this land.

The soils found on site are developed in reddish silty glacial drift and outwash deposits derived from adjoining Devonian and Silurian rocks. The soils are relatively uniform in texture and colour across the site, the main differences being:

1. The depth of the silty soil over the gravel which underlies the site, and
2. Slight variations in topsoil and subsoil texture. The depth of soil over gravel varies considerably from about 30 cm in the extreme southwest corner to more than 100 cm along the southern boundary. In general the depth of soil over gravel is least (30-60 cm) along the western and northern boundaries, and deepest (more than 75 cm) in the south east quarter and as a long thin strip adjacent to the western boundary.

The soils typically have a slightly stony (about 5%) silt loam topsoil though some exceptions have a clay loam topsoil (borings 4 and 20) or sandy silt loam topsoil (boring 2). Towards the southwest corner and along part of the southern boundary topsoils are much more stony (borings 20 and 14 respectively). Subsoil variation reflects that found in the topsoils with slightly stony, well-structured silt loams predominating though silty clay loam and sandy silt loam textures are also encountered. The subsoils are generally stonier than topsoils with values ranging from approximately 15-45%. Two soil pits excavated at borings 14 and 17 had a 41% and 33% respectively of total stones.

Most of the soils are naturally well-drained though impeded drainage and gleying is evident in the central and south eastern part of the site. The soils exhibiting signs of gleying belong to the Hamperley and Sannon soil series. Soils devoid of gley morphology belong to the Rowton soil series. Although the soils are stony most of the stones are small (ie. less than 2 cm) and are composed of soft silt stones and sandstones, therefore causing little hinderance to ploughing and other surface operations.

The main limitations to the agricultural use of the land are twofold:

1. Drought.
2. Workability.

These limitations reflect the depth of soil overlying the gravel and the presence of silt loam topsoils respectively. Where the gravel is near the surface there will be less available water to sustain plant growth in dry seasons. The silt loam topsoils are difficult to work with agricultural machinery in spring and autumn without damaging the soil structure. In general the more limiting factor is the restrictions on workability posed by the silt loam topsoil reflecting the relatively moist climate with 178 FC days. However, where the gravel is within 40 cm of the surface, the land approaches Grade 3a in quality due to a drought limitation.

The site was visited in May 1989 when a detailed soil survey was undertaken using 1 m Dutch soil augers. Soil borings were made on a 100 m grid and augered to 100 cm unless prevented from reaching this depth by the gravel. The average density of auger borings is 1 per hectare. In addition a soil pit was dug to obtain a better assessment of subsoil structure and to collect soil and stone samples for analysis.

At the time of survey the western half of the site was under an apple orchard and the eastern half under potatoes and wheat.

Agricultural Land Classification

Grade 2 land occupies 17.44 ha and accounts for 88.0% of the site. This grade of land covers virtually the whole of the site. The soils typically have a slightly stony silt loam topsoil which overlies slightly stonier subsoils of more variable texture but most typically consist of silt loam or silty clay loam. Signs of impeded drainage (gleying) are present below about 45 cm in soils in the south east section of the site but with field drainage these soils are considered to be Wetness Class I. The ungleyed soils are also considered to be Wetness Class I despite the presence of silty clay loam subsoil textures. The presence of significant volumes of stone in the subsoil and the proximity to the underlying gravel layer make most of the soils relatively porous. Despite the high stone content of the subsoils the soils are generally non-droughty for most agricultural and horticultural crops due to the moisture retentive silty nature of the soil; the softness of the stones and most importantly to the relatively moist climatic regime.

Most of the stones are small (less than 2 cm) and consist of soft sandstones and siltstones which weather down to produce a soil with a high silt content.

Within the area mapped as Grade 2 are smaller areas of better quality land (Boring 2) and some which approach Grade 3a in quality (borings 1, 4 and 22).

This is very good agricultural land capable of growing a wide range of agricultural and horticultural crops. At the time of survey it was growing apples, wheat and potatoes.

Grade 3a land occupies 0.75 ha and accounts for 3.7% of the site. This small area of land is in the southwest corner adjacent to derelict airfield buildings. The topsoil stone content is higher here than elsewhere on the site with about 10% stones greater than 2 cm. In addition the gravel is closer to the surface here (about 30 cm) than elsewhere on site. Two borings were attempted in this locality and both failed to penetrate deeper than 30 cm. The soils have a silty clay loam/silt loam topsoil texture with no evidence of gleying.

This is good quality agricultural land capable of growing a wide range of agricultural crops and some of the less demanding horticultural crops.

Non-agricultural land occupies 1.65 ha and accounts for 8.3% of the site. This land was not surveyed as it is not in agricultural use and includes derelict airfield buildings. The consultant's report indicates that the undisturbed soils in this area are similar to the Rowton soil series found on the adjoining farmed land.