**EPA STRIVE Programme 2007-2013**

# User Guide for Representative Soil Profile data capture system

# (2007-S-CD-1-S1)

# ISIS Final Technical Report 6

Prepared for the Environmental Protection Agency
by
Teagasc and Cranfield University

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## DISCLAIMER



The EPA STRIVE Programme addresses the need for research in Ireland to inform policymakers and other stakeholders on a range of questions in relation to environmental protection. These reports are intended as contributions to the necessary debate on the protection of the environment.

**EPA STRIVE PROGRAMME 2007-2013**

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# Executive Summary

The Irish Soil Information System (ISIS) project was established in 2008, following a comprehensive inventory of Irish soil data compiled by Daly and Fealy (2007) which highlighted that soil data coverage of Ireland was incomplete in both detail and extent. The ISIS project is funded under the Environmental Protection Agency STRIVE Research Programme 2007-2013 and co-funded by Teagasc. It was led by Teagasc with the participation of researchers from Cranfield University (UK) and University College Dublin. The overall objective of the ISIS project was to conduct a programme of structured research into the national distribution of soil types and construct a soil map, at 1:250,000 scale, which will identify and describe the soils according to a harmonised national legend. This map is now available in digital format and forms the basis of a new soil information system for Ireland (http://isis.teagasc.ie).

The ISIS project has utilised existing data and maps from the previous National Soil Survey (NSS) conducted by An Foras Talúntais (forerunner organisation to Teagasc). The NSS produced: mapping at 1:126,720 scale for 44% of the country; a General Soil Map of Ireland and a National Peatland map, both at 1:575,000 scale and other miscellaneous large scale mapping of experimental farms. In addition, more recent map products have been included such as the Indicative Soil and Subsoil mapping (Fealy and Green, 2009) with national coverage using GIS and remote sensing techniques.

Comparison of soil information at European scale has led to the requirement for the harmonisation and coordination of soil data across Europe, and, in light of the demands for soil protection on a regional basis within member states there is a growing need to support policy with a harmonised soil information system. The European Soil Bureau Network (ESBN) Technical Working Group dealing with Soil Monitoring and Harmonisation recommended a soil map of Europe at a scale of 1:250,000 as an economically feasible intermediate scale that can identify specific problems at regional scale (Montanarella and Jones, 1999).

The ISIS project adopted a combined methodology of utilising novel predicted mapping techniques in tandem with traditional soil survey applications. This unique combination at a national scale has resulted in the development of a new national soil map for Ireland. Building upon the detailed work carried out by the An Foras Talúntais (AFT) survey (known as *Terra Cognita*), the ISIS project generated soil-landscape models at a generalised scale of 1:250,000 for the counties of Carlow, Clare, Kildare, Laois, Leitrim, Limerick, Meath, Offaly, Tipperary South, Waterford, Westmeath, Wexford, West Cork, West Mayo and West Donegal. These soil-landscape models (also referred to as soilscapes) were used as the baseline data for statistical models (random forests, Bayesian belief networks and neural networks) to predict soil map units in counties where there was no map available (referred to as *Terra Incognita*). To validate the methodology, this work was supported by a 2.5 year field survey, in which 11,000 locations were evaluated for soil type, using an auger bore survey approach. These data were used to check the predicted soil mapping units (associations) for counties: Cavan, Dublin, East Cork, East Donegal, East Mayo, Galway, Kerry, Kilkenny, Louth, Monaghan, Roscommon, Sligo, Tipperary South and Wicklow, where a detailed soil

survey map was not available. Where new soil information was generated, due to previously unknown combinations of soil-landscape units, profile pits were selected at representative locations across the country. These 225 pits were described and sampled in detail and were used to generate a new soil classification system for the country. The final product is a unique combination of new and traditional methodologies and soils data from both the AFT and the ISIS project. The final, soil association map of Ireland consists of 58 associations (excluding areas of alluvium, peat, urban, rock or marsh) that are made up from 213 soil series. Associated representative profile information is available in the online soil information system.

A key component of the ISIS project has been the development of a soil and land information system and associated public web site. This system has been designed to hold the complete set of information deriving both from the ISIS field programme and modelling activity, as well as the previously existing legacy soils information available for Ireland. Drawing on this information system, the web site is designed to hold and disseminate this information online both in cartographic and tabular form to stakeholders. Prior to this development, there has been no harmonised computerised system in place to hold and manipulate national Irish soils data. The information system therefore addresses the pressing need and requirement for a publicly-accessible, integrated IT framework based upon contemporary informatics standards to serve the many and varied stakeholders having an interest in soils information in Ireland.

# Technical Note on Soil Classification

Two Irish soil classification systems were developed during the ISIS project. An **Interim Soil Classification** was developed in the early stages of the project to enable the harmonisation and generalisation of the county soil maps published by An Foras Talúntais (AFT) and the rationalisation of the original AFT soil series. The **Interim Soil Classification** was used during the development of Work Packages (WP): WP1 and WP2, to produce the training data for the predictive mapping and for most of the field programme in WP3. In 2013/4, **the Interim Soil Classification** was modified following a World Reference Base style hierarchical approach that recognises Great Soil Groups and defines sub-groups by supplementary diagnostic horizons. The **Final Soil Classification** System was developed to provide a more user-friendly classification system that adopts the approach of a hierarchical key for recognition of Great Soil Groups and diagnostic horizons to define the sub-groups.

The **Final Soil Classification** System was subsequently implemented during the description of representative soil profiles, final map production and is included in the updated soil profile handbook, and national soil series list. This modified system is the **Final Soil Classification** system for Ireland that appears in the map and associated information system on the ISIS website.

This Final Technical Report was developed using the **Interim Soil Classification**, and describes a significant contribution to the production of the final New Soil Map of Ireland. Table B below details the differences between the **Interim** and the **Final Soil Classification** Systems.

The **Final Soil Classification** System for Ireland has 3 hierarchical levels:

## 1. Great Soil Groups:

The classification criteria for the Great Soil Groups (GSG) were based on recognisable features used by An Foras Talúntais (National Soil Survey of Ireland) to classify the soils of Ireland at Great Soil Group level. Table A provides an overview of the key criteria for recognizing the Great Soil Groups. The sequence follows World Reference Base (WRB) principles.

## 2. Soil Sub-groups:

The Irish Soil Classification of soil sub-groups (SSG) is based on the recognition of diagnostic horizons, properties and materials which, where possible, should be observed and measured in the field. The selection of diagnostic characteristics takes into account their relationship with soil forming processes. Diagnostic features are selected that are significant to soil management. Subgroups are named with a maximum of two diagnostic features that represent the most important processes occurring in the soil profile. Table B provides a look-up table between the interim and the modified classification systems, listing the Great Soil Groups and Sub-groups.

## 3. Soil Series

The classification of series is based on the same principles as the interim classification system. Within a sub-group a series is further defined by the nature of the soil texture and parent material.

## 4. Soil Associations

For mapping purposes, the soil series are combined to form soil associations that are identified by the most frequently occurring soil series and combinations of ancillary series. Each association is named after the key (lead) soil series, which is the most extensive soil in the association, e.g. Kilrush series is the dominant component in the Kilrush Association. To facilitate mapping, each soil association based on the Interim Classification is assigned an alphanumeric code that comprises the soil subgroup code (numeric) concatenated with a single alphabetic character, e.g. 711b for Kilrush Association. In the Final Soil Classification, the Kilrush Association is assigned the code 0700b in accordance with Tables A and B. With respect to classification terminology, the reports (3, 4, 5, 11 & 12) describing the predictive mapping programme refer only to soil association codes that relate to the Interim Soil Classification. However, the ISIS Soil Information System contains a translation table that links the interim soil association codes to the codes that relate to the Final Soil Classification. Thus the results of the predictive mapping can be linked to the final version of the New Soil Map of Ireland.

**Table A: Sequencing of the Great Soil Groups (GSG) in the Final Irish Soil Classification**

| Criteria | GSG code | Great Soil Group (GSG) |
|---|---|---|
| Soils with thick organic layers | 1 | OMBROTROPHIC PEAT |
| | 2 | MINEROTROPHIC PEAT |
| Shallow or extremely gravelly soils | 3 | RENDZINAS |
| | 4 | LITHOSOLS |
| Soils influenced by water | 5 | ALLUVIAL SOILS |
| | 6 | GROUNDWATER GLEYS |
| | 7 | SURFACE-WATER GLEYS |
| Soils affected by Fe/Al chemistry increase | 8 | PODZOLS |
| | 9 | BROWN PODZOLICS |
| Soils with clay enriched subsoil | 10 | LUVISOLS |
| Relatively young or soils with limited profile development | 11 | BROWN EARTHS |

For more details of the finalised Irish Soil Classification System please refer to the following documents:

*ISIS Final Technical Report 10: Simo et al. (2014). The Irish Field Handbook for Soil Profile Descriptions. Available from http://erc.epa.ie.safer/reports*

*ISIS Final Technical Report 13: Simo et al. (2014). The Irish Soil Information System Map and Legend. Available from http://erc.epa.ie.safer/reports*

*ISIS Final Technical Report 9: Creamer et al. (2014). The Irish Soil Information System National Soil Series - Description and Classification of Representative Profiles. Available from http://erc.epa.ie.safer/reports*

| Table B Linkage between the Interim and Final Irish Soil Classifications for Soil Subgroups | | | |
|---|---|---|---|
| **Interim SSG_code** | **Interim Soil Subgroup (SSG)** | **SSG code** | **Soil Subgroup (SSG)** |
| 911 | Raw Ombrotrophic Peat Soils | 110 | Natural Ombrotrophic Peat Soils |
| 912 | Earthy Ombrotrophic Peat Soils | 170 | Drained Ombrotrophic Peat Soils |
| 913 | Cut-over Ombrotrophic Peat Soils | 180 | Cut-over Ombrotrophic Peat Soils |
| 914 | Industrial Ombrotrophic Peat Soils | 190 | Industrial Ombrotrophic Peat Soils |
| 921 | Raw Minerotrophic Peat Soils | 210 | Natural Minerotrophic Peat Soils |
| 922 | Earthy Minerotrophic Peat Soils | 270 | Drained Minerotrophic Peat Soils |
| | | 280 | Cut-over Minerotrophic Peat Soils |
| 211 | Typical Rendzinas | 300 | Typical Rendzinas |
| 215 | Histic Rendzinas | 310 | Histic Rendzinas |
| 213 | Humic Rendzinas | 360 | Humic Rendzinas |
| 214 | Stagnic Rendzinas | | |
| 212 | Gleyic Rendzinas | | |
| 111 | Typical Lithosols | 400 | Typical Lithosols |
| 113 | Histic Lithosols | 410 | Histic Lithosols |
| 112 | Humic Lithosols | 460 | Humic Lithosols |
| 821 | Typical Alluvial Gleys | 500 | Typical Alluvial Gley Soils |
| | | 510 | Histic Alluvial Gley Soils |
| 823 | Typical Calcareous Alluvial Gleys | 550 | Typical Calcareous Alluvial Gley Soils |
| | | 551 | Histic Calcareous Alluvial Gley Soils |
| 824 | Humic Calcareous Alluvial Gleys | 556 | Humic Calcareous Alluvial Gley Soils |
| 822 | Humic Alluvial Gleys | 560 | Humic Alluvial Gley Soils |
| 811 | Typical Brown Alluvial Soils | 570 | Typical Alluvial Soils |
| 812 | Gleyic Brown Alluvial Soils | 572 | Gleyic Alluvial Soils |
| 813 | Humic Brown Alluvial Soils | 576 | Humic Alluvial Soils |
| 721 | Typical Groundwater Gleys | 600 | Typical Groundwater Gleys |
| | | 610 | Histic Groundwater Gleys |
| 723 | Calcareous Groundwater Gleys | 650 | Calcareous Groundwater Gleys |
| | | 651 | Histic Calcareous Groundwater Gleys |
| 724 | Humic Calcareous Groundwater Gleys | 656 | Humic Calcareous Groundwater Gleys |
| 722 | Humic Groundwater Gleys | 660 | Humic Groundwater Gleys |
| | | 690 | Anthropic Groundwater Gleys |
| 711 | Typical Surface-water Gleys | 700 | Typical Surface-water Gleys |
| 712 | Humic Surface-water Gleys | 760 | Humic Surface-water Gleys |
| | | 790 | Anthropic Surface-water Gleys |
| 611 | Ferric Podzols | 800 | Typical Podzols |
| 621 | Typical Gley Podzols | 820 | Gleyic Podzols |
| 622 | Stagno-Gley Podzols | 830 | Stagnic Podzols |
| 632 | Iron-pan Stagno Podzols | 843 | Stagnic Iron-pan Podzols |
| 612 | HumoFerric Podzols | 860 | Humic Podzols |
| | | 890 | Anthropic Podzols |
| 631 | Ferric Stagno Podzols | | |
| 511 | Typical Brown Podzolics | 900 | Typical Brown Podzolics |
| 512 | Gleyic Brown Podzolics | 920 | Gleyic Brown Podzolics |
| 514 | Stagnic Brown Podzolics | 930 | Stagnic Brown Podzolics |
| | | 936 | Humi-Stagnic Brown Podzolics |
| 513 | Humic Brown Podzolics | 960 | Humic Brown Podzolics |
| | | 990 | Anthropic Brown Podzolics |
| 411 | Typical Luvisols | 1000 | Typical Luvisols |
| 412 | Gleyic Luvisols | 1020 | Gleyic Luvisols |
| | | 1026 | Humi-Gleyic Luvisols |
| 414 | Stagnic Luvisols | 1030 | Stagnic Luvisols |
| | | 1036 | Humi-Stagnic Luvisols |
| 413 | Humic Luvisols | 1060 | Humic Luvisols |
| 1020 | Technosols | 1090 | Anthropic Luvisols |
| 311 | Typical Brown Earths | 1100 | Typical Brown Earths |
| 312 | Gleyic Brown Earths | 1120 | Gleyic Brown Earths |
| | | 1126 | Humi-Gleyic Brown Earths |
| 314 | Stagnic Brown Earths | 1130 | Stagnic Brown Earths |
| 315 | Humi-stagnic Brown Earths | 1136 | Humi-Stagnic Brown Earths |
| 321 | Typical Calcareous Brown Earths | 1150 | Typical Calcareous Brown Earths |
| 322 | Gleyic Calcareous Brown Earths | 1152 | Gleyic Calcareous Brown Earths |
| 323 | Stagnic Calcareous Brown Earths | 1153 | Stagnic Calcareous Brown Earths |
| | | 1156 | Humic Calcareous Brown Earths |
| | | 1159 | Anthropic Calcareous Brown Earths |
| 313 | Humic Brown Earths | 1160 | Humic Brown Earths |
| | | 1190 | Anthropic Brown Earths |
| | | 1196 | Humi-Anthropic Brown Earths |

**ISIS Project**

# Representative Profile Field Recording System - Handbook


Jack Hannam; Ann Holden; Bob Jones; Stephen Hallett

v 2.2
Document: WP3_D3.1

This work is part of the Irish Soil Information System (ISIS) Project, managed by Teagasc (the Irish Agriculture and Food Development Authority) and co-funded by the Environmental Protection Agency (EPA) of Ireland through their Science, Technology, Research and Innovation for the Environment (STRIVE) Programme, as part of the National Development Plan 2007-2013.

## Document relates to profile database Version 1 M 05

# Contents

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Hannam, J.A., Holden, A., Jones, R.J.A., and Hallett, S.H. (2012) Representative Profile Field Recording System - Handbook. 82pp. NSRI, Cranfield University, UK.

Report cover, shows a gleyed exhibition profile opened up at Johnstown Castle, County Wexford.

# Representative Profile Field Recording System - Handbook

This guidebook and technical manual presents users with instructions of how to use the ISIS representative profile field recording system developed at Cranfield University as a part of the Irish Soil Information System 'ISIS' project.

## Commencing

Create a folder on the Tablet PC ready to hold the files in the distribution zip file, next, unzip the distribution fileset into this folder.
*e.g. 'c:|isis_repprofile|*

☝ **Full instructions** for installation and uninstallation of the tool are provided to the rear of this handbook.

## File Inventory

On unpacking the distribution zip file, you should have the following files present:

| File | Purpose |
|---|---|
| GIQ60.dat | Files relating to the use of the GPS and the transformation of locations in WGS84 to the Irish National Grid. |
| GIQ60.dll | Files relating to the use of the GPS and the transformation of locations in WGS84 to the Irish National Grid. |
| ReadMe.txt | Start-up instructions |
| registerquest.bat | System batch file used to register the 'GIQ60.dll' file. Note you need to edit this file before running it to record the location of the DLL file correctly. |
| SoilRepresent_Ireland.mde | 'Front end' file used to enter in data – this is the file you should open to start entering data. |
| SoilRepresent_Ireland_be.mdb | 'Back end' database containing the values recorded using the data entry system |
| unregisterquest.bat | System batch file used to unregister the 'GIQ60.dll' file. Note you need to edit this file before using it to record the location of the DLL file correctly. |

## How data is recorded

A part of the design philosophy of this application, the user interface is separated from the file containing the data recorded. The tool is developed in MS Access and, as Access allows both data and user interface in one file, this means that two Access database files are used to permit this separation – thus the 'back end' and 'front end' files. In effect this simplifies updating the user interface whilst not disrupting data already recorded in the system.

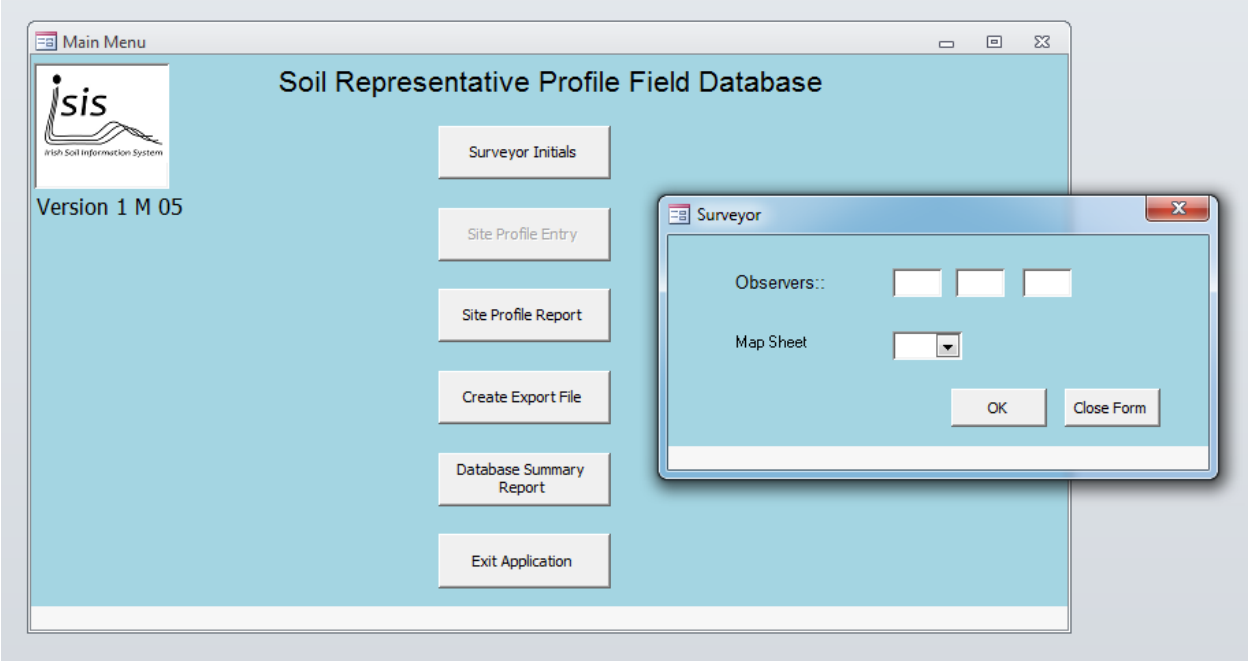
## Getting started

Initialise the GPS on the tablet PC by starting the virtual GPS and click the 'start GPS' button.

Open the file **'SoilRepresent_Ireland.mde'**

Before you can enter site or horizon details ('Site Profile Entry'), you need to add the surveyor's initials and map sheet, these are used to create unique reference number for the profile.

At the main menu form click 'Surveyors initials'. Enter Observers (Surveyor, student etc.) and select the appropriate map sheet from the drop down box. Click OK.




You have to repeat the steps outlined here every time you open and use a database.

Click on 'Site Profile Entry'. This opens up the main entry site profile form.

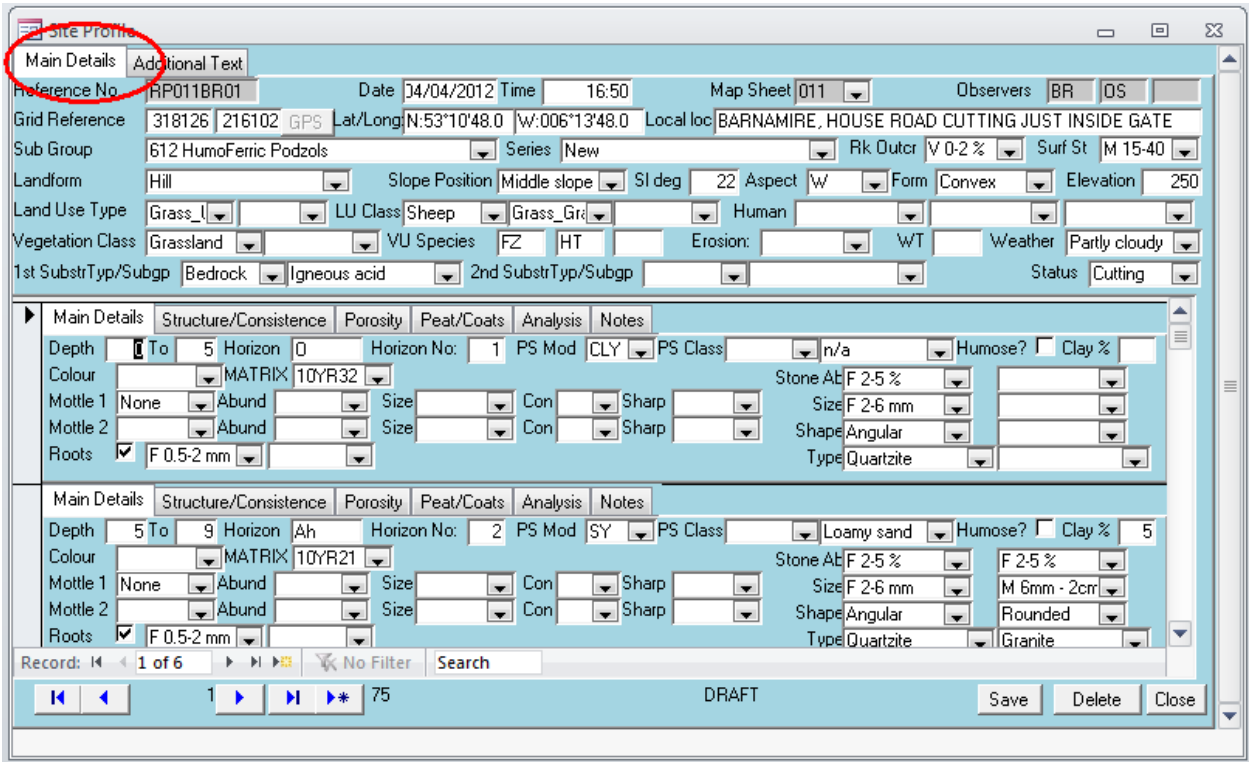
> **Linked Table problem?** If this is the first time you have run this tool, then before you can use it you may also have to run the 'Linked Table Manager' (found in Access under the Menu 'Tools') to connect up all the data tables required for this application.
>
> Go to the menu 'Tools' and select 'DB Utilities' and 'Linked Table Manager'. See the list of tables. Tick on the 'Always prompt for a new location', then 'select all' and 'OK'. Navigate to the appropriate 'back end' database, e.g. 'SoilRepresent_Ireland_be.mde' and 'OK'.

The data entry screen is coloured cyan to match the pre-printed card stock (see Appendix Three).

## Entering Site details

Site detail entries are stored in the **M_SiteProfile** table in the database. Site details comprise main details as well as additional text entries for the site.

### *Main details*

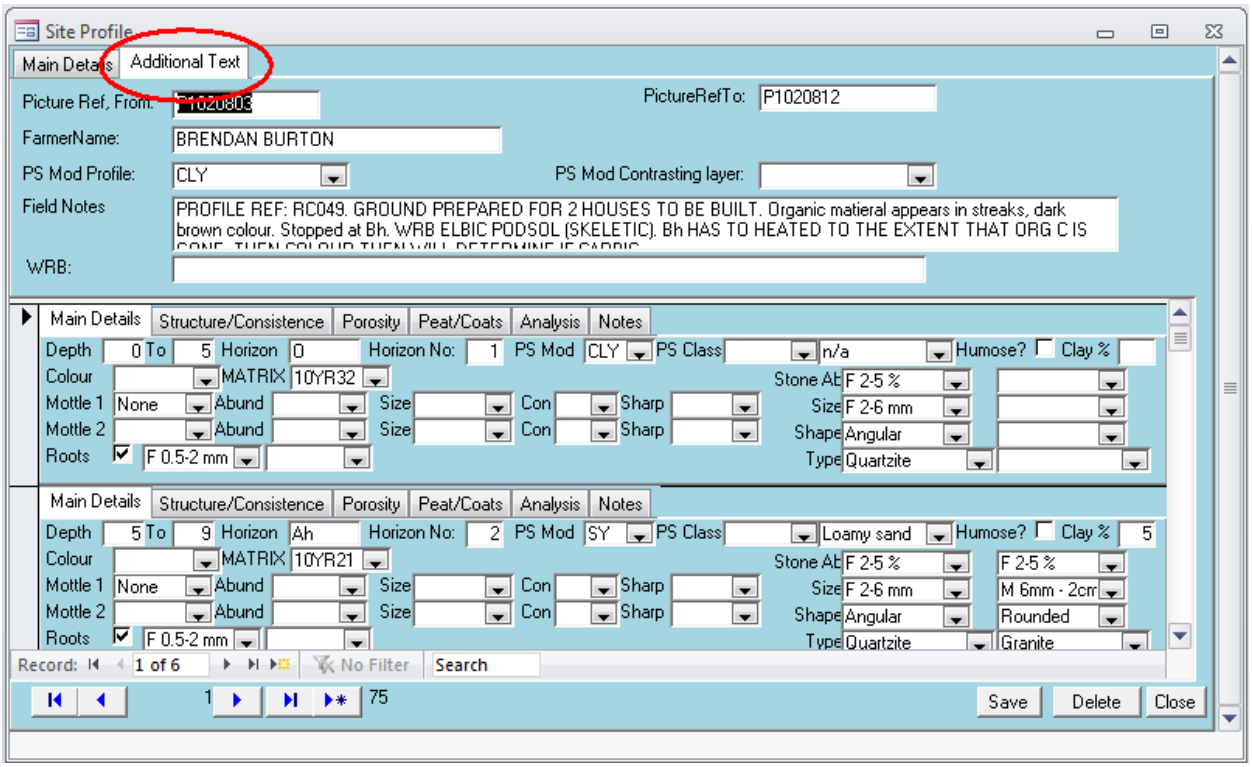



| Main details entry | Type of entry | Details |
|---|---|---|
| Reference number | Not editable | Unique reference number is automatically created for the Representative Profile from the sequence 'RP' + MAPSHEETNUMBER + OBSERVER1INITIALS + SEQUENTIAL NUMBER [e.g. RPO11BR01]. |
| Date | Date/time | The date, in the form dd/mm/yyyy should be added automatically from the tablet PCs clock |
| Time | Date/time | HH:MM – automatically added from tablet PC |
| Map sheet | Not editable | Added automatically from the surveyors form filled in prior to the site entry form. |
| Observers | Not editable | Added automatically from the surveyors form filled in prior to the site entry form. |
| Grid reference | Numeric | Lat/Long from GPS is automatically converted to the Irish national grid. If no GPS fix is possible the easting/northing can be entered manually from an OSI map, e.g. "245334" and "126040". Note, do not enter grid using decimals (e.g. 24.5). |
| GPS fix | Press button | The GPS should have been initialized before the DB is opened. Pressing this button will call on the internal tablet PC GPS to get a location fix. It will enter the lat/long and the Irish national grid to the table |

| | | |
|---|---|---|
| | | automatically. **This should be done after the rest of the form is completed to ensure the GPS has had sufficient time to get a fix.** |
| Lat/Long | Numeric | Displays Lat/Long from internal GPS.<br><br>If you are entering values from a card entry, or no GPS fix is possible you can enter the location manually from camera or other GPS device, e.g. "N:52°23'41.40" and "W:007°20'57.40".<br><br>Note, just enter the digits into the formatted field. However, **you MUST enter the full two decimal places**, e.g. '41.40' NOT '41.4' and '57.40' NOT '57.4' or there **WILL BE AN ERROR** in the conversion to the Irish Grid.<br><br>*If you receive an error when entering Lat/Long, it is suggested you unregister and then reregister the 'GIQ60.dll' file using the 'unregisterquest.bat' and then the 'registerquest.bat' files – edited to point correctly to the DLL location.* |
| Local loc | Free text | Add details of farm/village/township location |
| Sub group | Drop down menu | Select a sub group class |
| Series | Drop down menu | Select. This list will only include identified series within the sub group selected as well as 'new'. |
| Rock Outcrops | Drop down menu | Select a rock outcrops class |
| Surface Stoniness | Drop down menu | Select a surface stoniness class |
| Landform | Drop down menu | Select a Landform class |
| Slope position | Drop down menu | Select a slope position class |
| Sl degree | Numeric | Enter slope degree |
| Aspect | Drop down menu | Select an aspect class |
| Form | Drop down menu | Select a form class |
| Elevation | Numeric | Enter elevation in metres |
| Land use type | Drop down menu | Select up to two land use types |
| LU class | Drop down menu | Select up to three land use classes |
| Human | Drop down menu | Select up to three human influences |
| Vegetation class | Drop down menu | Select up to two vegetation classes |
| VU species | Free text | Enter codes (to be determined) |
| Erosion | Drop down menu | Select an erosion category |

| | | |
|---|---|---|
| WT | Numeric | Enter depth to water table. Enter 0 if not found. |
| Weather | Drop down menu | Select a weather class |
| First Substr Type/Subgroup | Drop down menu | Select First Substrate Type/Subgroup combinations |
| Second Substr Type/Subgroup | Drop down menu | Select Second Substrate Type/Subgroup combinations |
| Status | Drop down menu | Select a status class relating to the type of the profile you are recording |

### *Additional text*



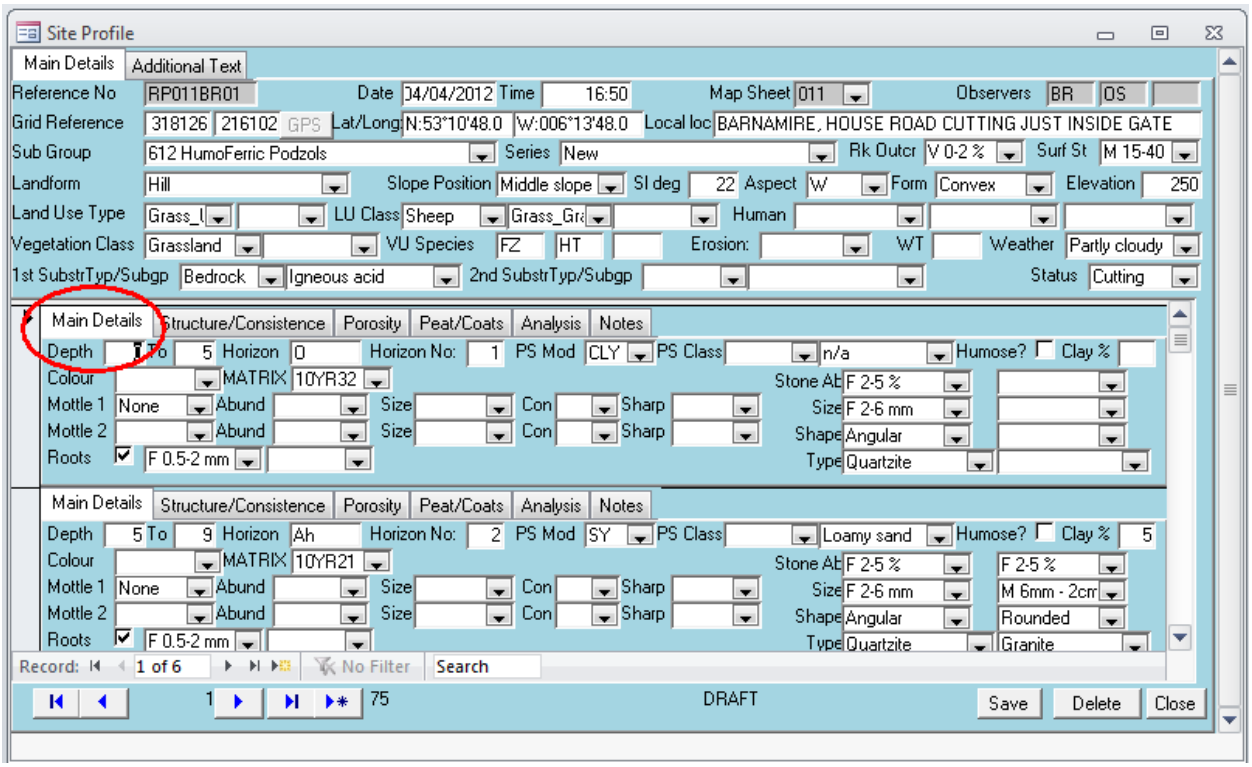

| Main details entry | Type of entry | Details |
|---|---|---|
| Picture ref from Picture ref to | Free text | Enter full picture reference from camera for start and end of photograph suite for the site and profile. This should start with an alphabetic character (p) and omit any hyphens between numbers. |
| FarmerName | Free text | Enter Farmer's name |
| PS Mod Profile | Drop down menu | Select a broad particle size class, e.g. Clayey CEY |
| PS Mod Contrasting Layer | Drop down menu | Select a broad particle size class found lower in the profile that is contrasting, e.g. Sandy SY. |
| Field notes | Free text | Notes for the profile site |
| WRB | Free text | Notes for recording profile WRB observations |

Once site details are recorded, separate entries are made for each horizon observed.

**Site or Horizon?** Please ensure you have entered and registered a site (by entering some details) before you attempt to enter in horizon information. Site data must precede the horizon data.

## Profile Horizon main details

Horizon entries are stored in the **M_SoilHorizon** table in the database.



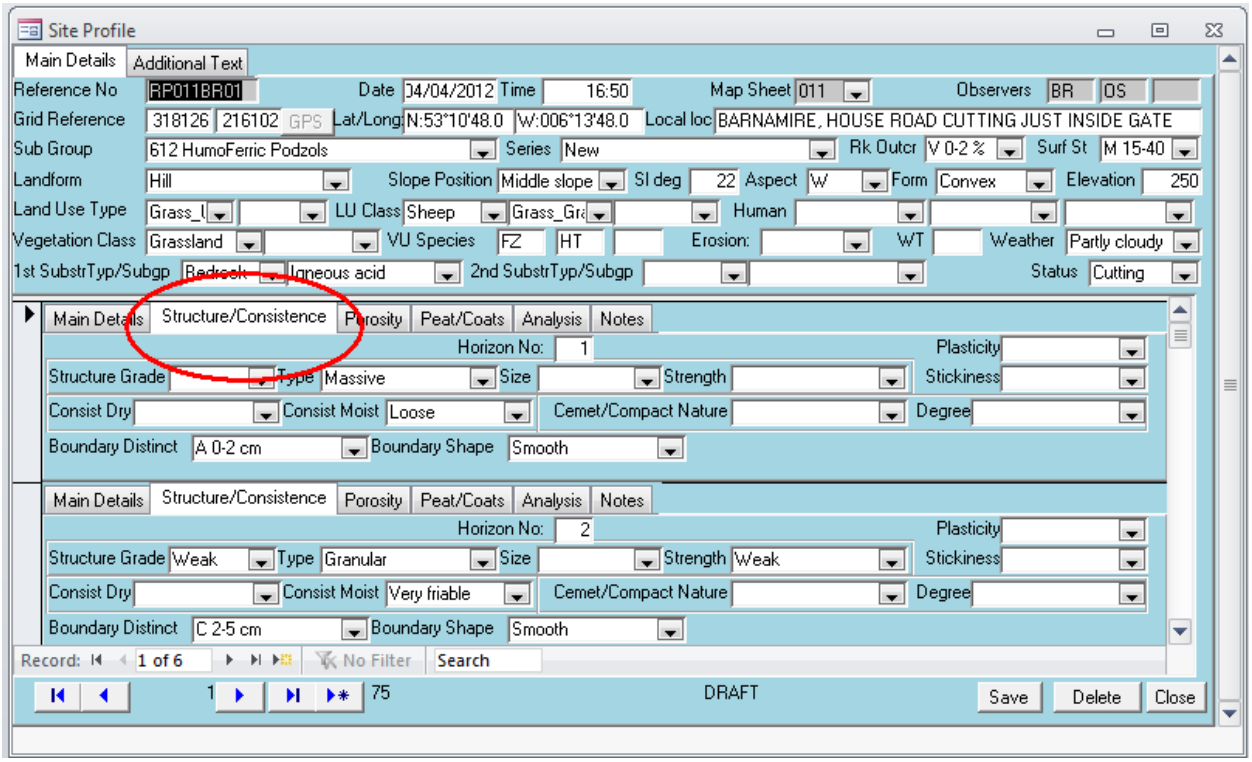

***Main details tab:***

| Soil profile main details | Type of entry | Details |
|---|---|---|
| Depth… to… | Numeric | Enter start and end depths of horizon in cm |
| Horizon | Free text | Enter horizon designation |
| Horizon No. | Numeric | Enter horizon number |
| PS Mod | Drop down | Select a broad particle size class. Select from drop down menu |
| PS class (box 1) | Drop down | Particle size class (PSC) qualifier for sandy soils and peat only. Select from drop down menu |
| PS class (box 2) | Drop down | Particle size class (PSC). Select from drop down menu; includes peat as a PSC |
| Humose? | Tick box | Check if profile is humose, otherwise leave blank if not humose. |
| Clay% | Numeric | Estimated clay content. Enter the percentage. |
| Colour | Drop down | Select the moisture state of the sample being examined for its colour. Select from drop down menu |
| Matrix | Drop down | Select Munsell colour code. Select from drop down menu. Note, typing the colour locates chroma and value more quickly. |
| Mottle 1 | Drop down | Select Mottle 1 Munsell colour code. Select from drop down menu. Note, typing the colour locates chroma and value more quickly. |
| (Mottle 1) | Drop down | Select Mottle Abundance from drop down menu |

| | | |
|---|---|---|
| Abund | | |
| (Mottle 1) Size | Drop down | Select Mottle Size from drop down menu |
| (Mottle 1) Con | Drop down | Select Mottle Contrast from drop down menu |
| (Mottle 1) Sharp | Drop down | Select Sharpness of Mottle boundaries from drop down menu |
| Mottle 2 | Drop down | Select Mottle 2 Munsell colour code. Select from drop down menu. Note, typing the colour locates chroma and value more quickly. |
| (Mottle 2) Abund | Drop down | Select Mottle Abundance from drop down menu |
| (Mottle 2) Size | Drop down | Select Mottle Size from drop down menu |
| (Mottle 2) Con | Drop down | Select Mottle Contrast from drop down menu |
| (Mottle 2) Sharp | Drop down | Select Sharpness of Mottle boundaries from drop down menu |
| (Stone 1) Stone Ab | Drop down | Select Stone Abundance (by volume) from drop down menu |
| (Stone 1) Size | Drop down | Select Stone Size class from drop down menu |
| (Stone 1) Shape | Drop down | Select Stone Shape from drop down menu |
| (Stone 1) Type | Drop down | Select Stone Type (Lithology) from drop down menu |
| (Stone 2) Stone Ab | Drop down | Select Stone Abundance (by volume) from drop down menu |
| (Stone 2) Size | Drop down | Select Stone Size class from drop down menu |
| (Stone 2) Shape | Drop down | Select Stone Shape from drop down menu |
| (Stone 2) Type | Drop down | Select Stone Type (Lithology) from drop down menu |
| Roots (box 1) | Check box | Select if roots present, otherwise leave blank. |
| Roots (box 2) | Drop down | Select Size of Roots where present from drop down menu |
| Roots (box 3) | Drop down | Select Abundance of Roots where present from drop down menu |

### *Entering Structure/Consistence details*

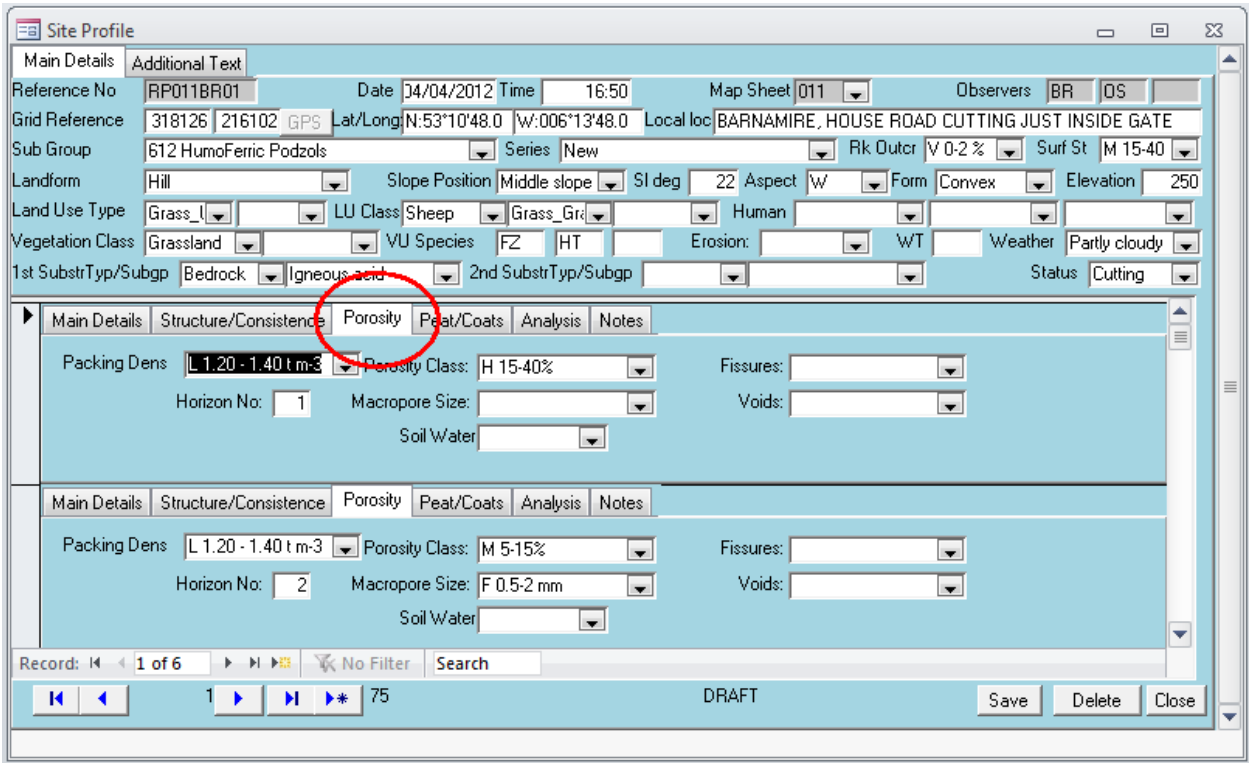
You can enter soil structural or consistency information with the second tab.




| Soil profile structure / consistence details | Type of entry | Details |
|---|---|---|
| Horizon No | Free text | Horizon number can be observed (or edited) |
| Plasticity | Drop down | Select a soil plasticity class from drop down menu |
| Structure Grade | Drop down | Select a structure grade class from drop down menu |
| Type | Drop down | Select a structure type class from drop down menu |
| Size | Drop down | Select a structure size class from drop down menu |
| Strength | Drop down | Select a structure strength class from drop down menu |
| Stickiness | Drop down | Select a soil stickiness class from drop down menu |
| Consist Dry | Drop down | Select a dry consistency class from drop down menu |
| Consist Moist | Drop down | Select a moist consistency class from drop down menu |
| Cemet/Compact Nature | Drop down | Select a soil cementation or compactness cause from drop down menu |
| Degree | Drop down | Select the degree of soil cementation or compactness from drop down menu |
| Boundary Distinct | Drop down | Select the distinctness of the boundary to the horizon below the one being considered from a drop down menu. |
| Boundary Shape | Drop down | Select the shape of the boundary to the horizon below the one being considered from a drop down menu. |

### *Entering Porosity details*

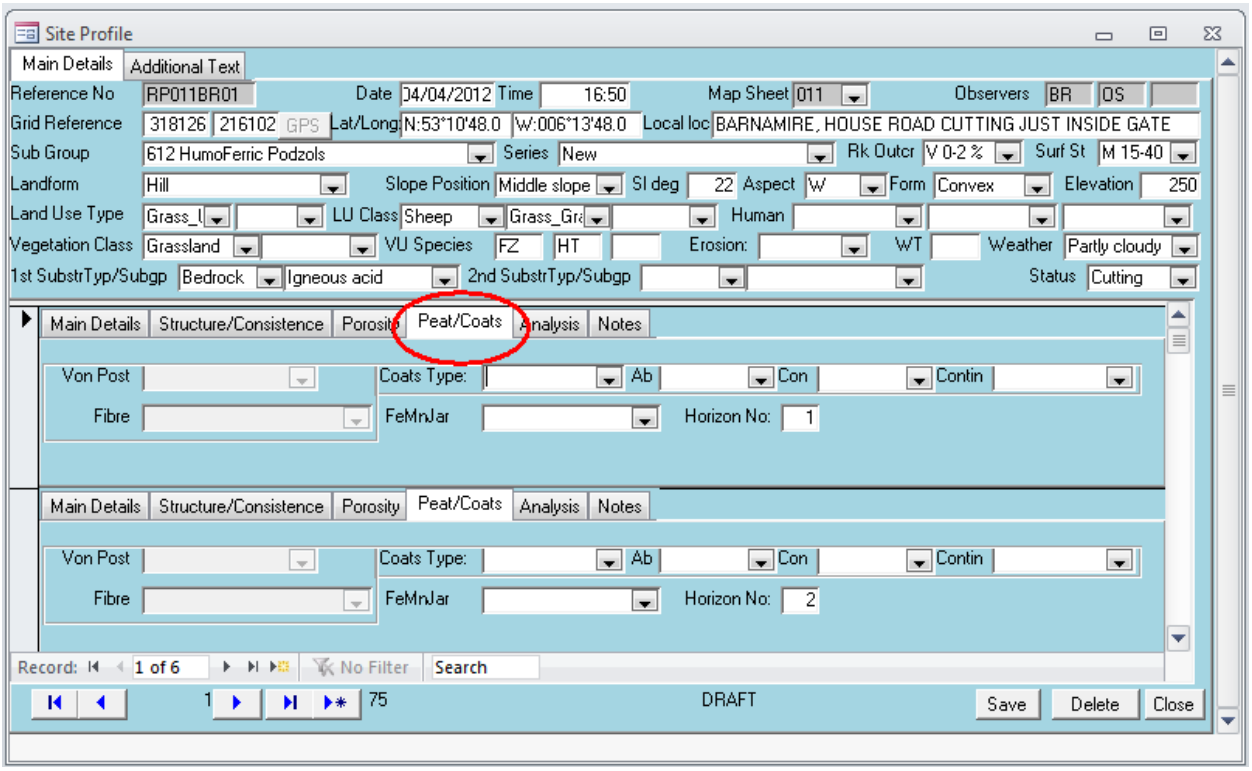
You can enter soil porosity information with the third tab.




| Soil porosity structure details | Type of entry | Details |
|---|---|---|
| Packing Density | Drop down | Select the soil packing density class from a drop down menu |
| Porosity Class | Drop down | Select the soil porosity class from a drop down menu |
| Fissures | Drop down | Select the soil fissures class from a drop down menu |
| Horizon No | Free text | Horizon number can be observed (or edited) |
| Macropore Size | Drop down | Select the soil macroporosity class from a drop down menu |
| Voids | Drop down | Select the soil voids class from a drop down menu |
| Soil Water | Drop down | Select the soil water state from a drop down menu |

### *Entering Peats/Coats details*

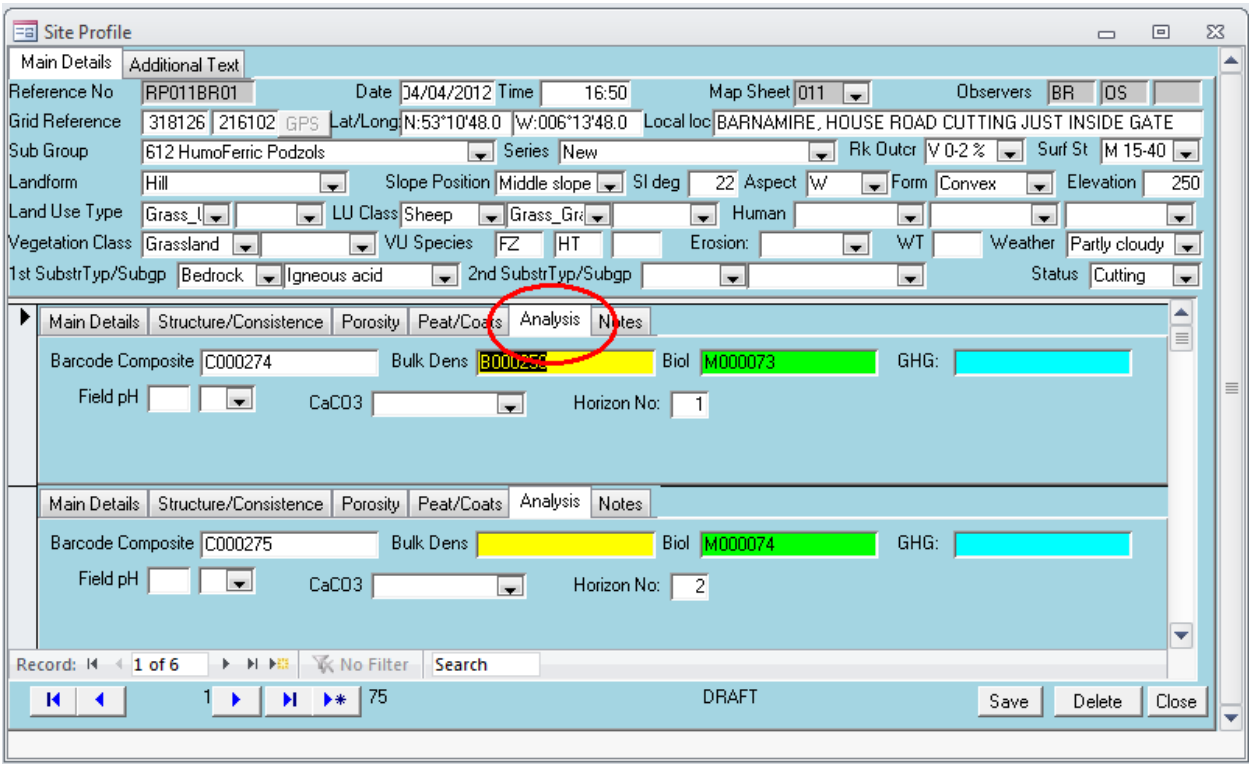
You can enter Peat / Coats details with the fourth tab.




| **Soil profile structure details** | **Type of entry** | **Details** |
|---|---|---|
| Von Post | Drop down | Select the Von Post class (degree of humification) from a drop down menu. Note this is only permissible for a peat horizon |
| Fibre | Drop down | Select the degree of 'fibrosity' of the Peat horizon from a drop down menu |
| Coats type | Drop down | Select the type of coats observed from a drop down menu |
| Ab | Drop down | Select the abundance of coats observed from a drop down menu |
| Con | Drop down | Select how contrasting the coats observed are from a drop down menu |
| Contin | Drop down | Select the continuity of the coats observed from a drop down menu |
| Fe/Mn/Jar Abundance | Drop down | Select the abundance of ferri-manganiferous or jarosite nodules/concretions in the horizon being observed from a drop down menu |
| Horizon No | Free text | Horizon number can be observed (or edited) |

### *Entering Analysis details*

You can enter Analysis details with the fifth 'analysis' tab.

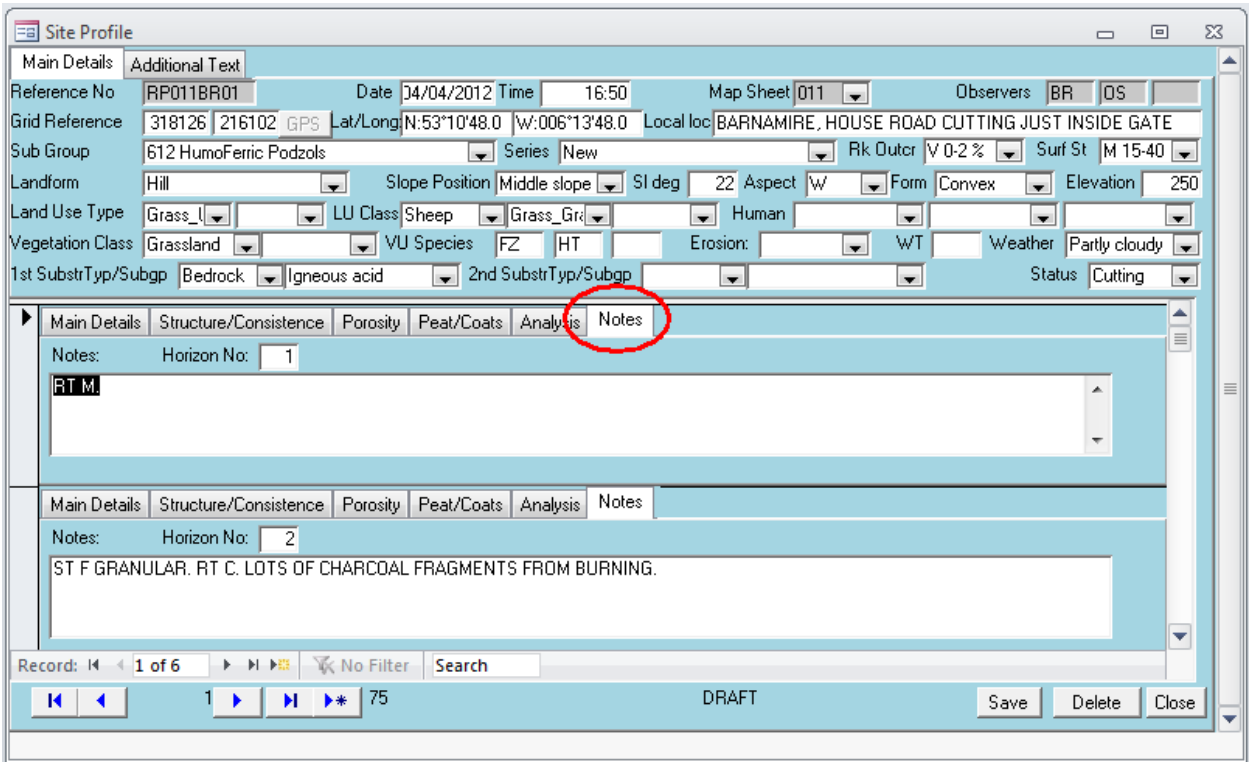



| **Soil profile Peat/Coats details** | **Type of entry** | **Details** |
|---|---|---|
| Barcode Composite | Text | Use the bar code scanner to enter composite sample barcodes |
| Barcode Bulk Density | Text | Use the bar code scanner to enter bulk density sample barcodes |
| Barcode Biology | Text | Use the bar code scanner to enter biological sample barcodes |
| Barcode GHG | Text | Use the bar code scanner to enter Green House Gas sample barcodes |
| Field pH (box 1) | Numeric | Enter pH from field measurement (between 2 and 14) |
| Field pH (box 1) | Drop down | Field pH method. Select from drop down menu |
| CaCO3 | Drop down | Carbonate reaction with HCl. Select from drop down menu |
| Horizon No | Free text | Horizon number can be observed (or edited) |

Note the colour coding of the data entry field for bar code numbers, matching the colour of the pre-printed label stock.

### *Entering Notes details*

You can enter Horizon Notes with the sixth tab.




| Notes details | Type of entry | Details |
|---|---|---|
| Notes | Text | Horizon notes may be entered as free text |
| Horizon No | Free text | Horizon number can be observed (or edited) |

### *Advancing to a new record or horizon*

Once details have been entered press save. Error messages will be displayed if compulsory fields have not been filled in.

To advance to a new horizon at a site use the arrow buttons at the bottom of the horizons form.

To advance to a new record at the next site use the arrow buttons at the bottom of the form.

## Installation of Tool

If the Microsoft Access database is not previously installed on the Laptop/PC then the Microsoft Access 2007 'Runtime' will need to be installed. This can be downloaded for free from: http://www.microsoft.com/downloads/details.aspx?familyid=d9ae78d9-9dc6-4b38-9fa6-2c745a175aed&displaylang=en

The Tablet PC has a GPS unit controlled by a software module. The GPS software uses third party software which is free to distribute, but the linked library ' DLL file needs to be registered first on the PC.

To do this: Edit (right mouse click and select 'edit') the file "registerquest.bat" and replace "C:\Users\AGP02\Desktop\SoilRepresentDB_V1_M5\GIQ60.dll" with the path name to the newly created folder you made where the file "GIQ60.dll" has been copied to, e.g. "C:\ISIS\SoilRepresentDB_V1_M5\GIQ60.dll"

Next, run the .bat file (double click batch file name <registerquest.bat>). This adds functionality to convert the GPS latitude and longitude data to Irish grid also during the import facility. Your account must have administrator rights to do this.

### *Problems registering the DLL file?*

After editing the batch file and running it, you may encounter an error dialog such as that below.


If so, this means your logon account on the computer does not have the administrative privileges necessary to run the 'RegSvr' command (which registers the DLL file). In this case you will need to ask your system administrator to assist. If you locate the Start -> Accessories -> 'Command prompt', and right mouse click and select 'Run as', you can then select the administrators account (you still need to enter the system password). Once you are running a command window as Administrator, you should be able to run the registration batch file successfully.

Once the batch file has run successfully and the files are installed correctly in the new folder you created, you may also wish to right click the Microsoft Access database 'SoiRepresent_Ireland.mde' and select "Send To" desktop. This will create a shortcut to the database on the desktop making it easier to start up and use.

👍 Note that should you install multiple versions of the database on your PC in separate folders (for example for recording a number of different field sessions), you do NOT need to re-register the DLL each time. The first registration process, described above, will suffice. Just remember that if that initial folder is ever renamed or removed, then the DLL is inaccessible to other installations and so you would need to unregister and then re-register a new folder location.

## Configuring the Auger Field Database on the Tablet PC or Desktop PC before use

Before use, the database will need to be configured:

Open the Microsoft Access database 'SoilRepresent_Ireland.mde'.

If the DLL registration went well above, there will be no error messages about it. However, you may see an error regarding a 'potential security concern' when starting - ignore this & select 'Open'.

Select Main Menu item "Tools" -> "Database Utilities" -> "Linked Table Manager". Press the "Select All" button and tick the "Always prompt for new location" checkbox below the list . Press OK. Navigate to the folder containing the installation (e.g."C:\ISIS\SoilRepresentDB_V1_M5") and then select the file "SoilRepresentDb_Ireland_be.mdb",click "Open". If successful a message "All selected linked tables were successfully refreshed" will appear, click "OK". Click "Close" to close the Linked Table Manager.

***Explanation:*** Good programming practice separates the data from the program code, allowing for easy future updates of the code if required without affecting the data. Here there are two files: 'SoilRepresent_Ireland.mdb' which the user runs and which contains the data entry form, and 'SoilRepresent_Ireland_be.mdb' which the user does not run and which contains the data.

## Running the Auger Field Database on the Tablet PC or Desktop PC

You should now be running the file 'SoilRepresent_ireland.mde' and so be ready to start the data capture program. You will have to enter your initials and the mapsheet number before you can enter data.

### *For Tablet PC only*

The database contains a function to retrieve GPS co-ordinates from the internal GPS in the Tablet PC, returning the latitude and longitude. The function also automatically converts these coordinates to the Irish grid. The GPS fix and Irish grid conversion has not been tested as this can only be done in Ireland. This refers only to the "Get GPS fix" button on the input form for the site details.

The port and baud rate for the GPS can be adjusted in the Microsoft Access db via the data table 'z_gpssettings'. By default, it has been set to port 8.

To enable the GPS to start Virtual GPS. Under 'Settings' select com8 and add it as a virtual GPS port. This will allow the database to use port 8 for the GPS. Note that this is all a one off process.

Every time you wish to use the GPS start virtual GPS and click the start GPS button.

## Uninstalling the database

There is no need to uninstall the database at this stage but a description of the uninstall procedure is given below

To uninstall, remove the Microsoft Access database 'SoilProfile_Ireland.mdb' and 'SoilProfile_Ireland_be.mdb'

Next, you can empty the recycle bin.

Edit (right mouse click and select 'edit') the batch file "unregisterquest.bat" and replace "C:\Users\AGP02\Desktop\SoilRepresentDB_V1_M5\GIQ60.dll" with the path name to where the file "GIQ60.dll" has been copied, e.g.

"C:\ISIS\SoilRepresentDB_V1_M5\GIQ60.dll"

Run the .bat file (double click batch file name <unregisterquest.bat>). This removes the functionality to convert the GPS latitude and longitude data to Irish grid also during the import facility. Note, you need to run this batch file with administrative privileges (see above for details).

## Appendix One: Schema for the Representative Profile Database

The following two tables present the key site and profile tables from the Cranfield Representative Profile Database, together with example data for each.

**Table. M_SiteProfile**

| | |
|---|---|
| **ReferenceNum** | RPS24AH01 |
| **Observor1** | AH |
| **Observor2** | |
| **Observor3** | |
| **SURVEYDATE** | 18-Oct-11 |
| **SurveyTime** | 00-Jan-00 |
| **X** | 43.12 |
| **Y** | 25.52 |
| **Elevation** | 110 |
| **GPSDate** | |
| **GPSTime** | |
| **Latitude** | 52.93352778 |
| **Longitude** | -8.566722222 |
| **MapSheet** | S24 |
| **GridRefChanged** | TRUE |
| **FarmerName** | James Horam |
| **LocalLoc** | Field alongside driveway, Ballyhusksy Farm |
| **PictureRefFrom** | A2021343 |
| **PictureRefTo** | A2021351 |
| **SUBGROUP** | 414 Stagnic Luvisols |
| **SERIESNAME** | Fethard |
| **Definition** | |
| **WRB** | Luvisol |
| **Texture1** | Fine loamy |
| **Texture2** | |
| **SlopePosition** | Lower slope |
| **SLOPEDegree** | 2 |
| **SLOPEForm** | Straight |
| **SlopeAspect** | SW |
| **LandForm** | Undulating |
| **LANDUSEType1** | Grassland improved |
| **LANDUSEType2** | |
| **Landuseclass1** | Grass grazed |
| **Landuseclass2** | |
| **Landuseclass3** | |
| **Human1** | Fertilizer applications |
| **Human2** | Surface compaction |
| **Human3** | |
| **VEGETATIONClass1** | |

| | |
|---|---|
| **VEGETATIONClass2** | |
| **VUSpecies1** | |
| **VUSpecies2** | |
| **VUSpecies3** | |
| **Erosion** | |
| **WT** | 0 |
| **Weather** | Partly cloudy |
| **1stSubstrateType** | Drift |
| **1stSubstrateSubgroup** | Siliceous stones |
| **2ndSubstrateType** | |
| **2ndSubstrateSubgroup** | |
| **RockOutcrops** | N 0 % |
| **SurfaceStone** | N 0 % |
| **Status** | ProfilePit |
| **Notes** | Poor Grass with rank herbage |
| **Draft** | TRUE |
| **Export** | FALSE |
| **ExportDate** | |

**Table. M_SoilHorizon**

| | |
|---|---|
| **ReferenceNum** | RPS24AH01 |
| **DEPTH** | 0 |
| **HorizonNum** | 1 |
| **DepthTo** | 20 |
| **HORIZON** | Ap |
| **BarcodeComposite** | |
| **BarcodeBulkDensity** | |
| **BarcodeBiology** | |
| **BarcodeGHG** | |
| **ColourTxt** | moist |
| **MATRIX** | 10YR43 |
| **MOTTLE1** | 75YR46 |
| **MOTTLE2** | |
| **MOT1ABUND** | F 2-5 % |
| **MOT2ABUND** | |
| **MOT1Size** | F 2-6mm |
| **MOT2Size** | |
| **Mot1Con** | Distinct |
| **Mot2Con** | |
| **Mot1Sharp** | S < 0.5 mm |
| **Mot2Sharp** | |
| **STONEABUND1** | C 5-15 % |
| **STONEABUND2** | |
| **STONESIZE1** | 2-6 cm |

| | |
|---|---|
| **STONESIZE2** | |
| **StoneShape1** | Sub rounded |
| **StoneShape2** | |
| **STONETYPE1** | Sandstone |
| **STONETYPE2** | |
| **HUMOSE** | FALSE |
| **PSCPeat1** | |
| **PSCPeat2** | Loam |
| **ClayPC** | 24 |
| **FieldPH** | |
| **FieldPHCode** | |
| **Roots** | TRUE |
| **RootsSize** | Very fine |
| **RootAbund** | M > 20 |
| **ABUNDFE** | 0 % |
| **CACO3** | No reaction |
| **SoilWaterCode** | Dry |
| **PSMOD** | Fine loamy |
| **Peat** | FALSE |
| **VONPOST** | |
| **FIBRE** | |
| **TEXTURE** | |
| **PEATTYPE1** | |
| **PEATTYPE2** | |
| **CoatsType1** | |
| **CoatsType2** | |
| **CoatsAbund1** | |
| **CoatsAbund2** | |
| **Coats1Con** | |
| **Coats2Con** | |
| **CoatsContin1** | |
| **CoatsContin2** | |
| **ConsistDry** | |
| **ConsistMoist** | Friable |
| **Plasticity** | Slightly plastic |
| **Stickiness** | Slightly sticky |
| **StructureGrade** | Moderate |
| **StructureType** | Sub-angular blocky |
| **StructureSize** | FF < 10mm |
| **StructureStrengthCode** | Weak |
| **CompactNature** | |
| **CompactDegree** | |
| **BoundaryDistinct** | C 2-5 cm |
| **BoundaryShape** | Smooth |
| **PackingDens** | M 1.45 - 1.75 t m-3 |
| **Porosity** | |

| | |
|---|---|
| **Fissures** | |
| **Macropores** | |
| **Voids** | |
| **Notes** | Some small Stones |

## Appendix Two: Code Tables in the Representative Profiles Database

This appendix lists out the contents of all the supporting look-up data tables used by the field data entry programme for representative profiles.

### *Table S_BoundaryDistinctness*

| IndexCol | BoundaryDistinctCode | BoundaryDistinctText | BoundaryDistinctPC | BoundaryDistinct |
|---|---|---|---|---|
| 1 | A | Abrupt | 0-2 cm | A 0-2 cm |
| 2 | C | Clear | 2-5 cm | C 2-5 cm |
| 3 | G | Gradual | 5-15 cm | G 5-15 cm |
| 4 | D | Diffuse | > 15 cm | D > 15 cm |

### *Table S_BoundaryShape*

| IndexCol | BoundaryShapeCode | BoundaryShapeText | BoundaryShapeDesc |
|---|---|---|---|
| 1 | S | Smooth | Nearly plane surface |
| 2 | W | Wavy | Pockets less deep than wide |
| 3 | I | Irregular | Pockets more deep than wide |
| 4 | B | Broken | Discontinuous |

### *Table S_CaCO3*

| List | CaCo3Code | CaCo3PC | CaCo3Text |
|---|---|---|---|
| 1 | N | 0 | No reaction |
| 2 | SL | 0-2% | Audible but not visible |
| 3 | MO | 2-5 % | Visible |
| 4 | ST | 5-15 % | Strongly visible |
| 5 | EX | > 25 % | Extremely strong (thick foam) |

### *Table S_CoatsAbund*

| IndexCol | CoatsAbundCode | CoatsAbundPC | CoatsAbundText | Coats_Abun |
|---|---|---|---|---|
| 1 | N | None | None | N None |
| 2 | VF | 0-2 % | Very few | VF 0-2 % |
| 3 | F | 2-5 % | Few | F 2-5 % |
| 4 | C | 5-15 % | Common | C 5-15 % |
| 5 | M | 15-40 % | Many | M 15-40 % |
| 6 | A | 40-80 % | Abundant | A 40-80 % |

### *Table S_CoatsContinuity*

| IndexCol | CoatsContinCode | CoatsContinText |
|---|---|---|
| 1 | B | Broken |
| 2 | D | Discontinuous |
| 3 | C | Continuous |

### *Table S_CoatsType*

| CoatsTypeCode | CoatsTypeText |
|---|---|
| CA | CaCO3 |
| CL | Clay |
| FE | Sesquioxides |
| HU | Humus |
| JA | Jarosite |
| MN | Manganese |
| PR | Pressure faces |
| SA | Sand |
| SI | Silica |
| SL | Slickensides |
| ST | Silt |

### *Table S_Colour*

| ColourTxt |
|---|
| Air dry |
| Moist |
| Ped face |
| Rubbed |

### *Table S_community*

| CODE | COMMUNITY | CommunityAbbrev |
|---|---|---|
| CE | Cereals | Cereals |
| CEMA | Maize | Maize |
| CEOA | Oats | Oats |
| CERY | Rye | Rye |
| CESB | Spring Barley | Spring Barley |
| CEWB | Winter Barley | Winter Barley |
| CEWW | Winter wheat | Winter wheat |
| FR | Fruits | Fruits |
| FRSF | Soft Fruit (strawberries, blackcurrants) | Soft Fruit |
| FRTF | Top fruit (apples, pears, plums) | Top Fruit |
| GR | Grass | Grass |
| GRCL | Clover | Clover |
| GRCO | Grass conserved (hay/silage) | Grass_Conserve |

| | | |
|---|---|---|
| GRGR | Grass grazed | Grass_Grazed |
| GRMI | Miscanthus | Miscanthus |
| OI | Oilcrops | Oilcrops |
| OIRA | Oilseed rape | Oilseed rape |
| RO | Root crops | Root crops |
| ROBE | Sugar Beet | Sugar Beet |
| ROFB | Fodder Beet | Fodder Beet |
| ROPO | Potatoes | Potatoes |
| ROSW | Swedes | Swedes |
| ST | Stock | Stock |
| STBE | Beef | Beef |
| STDE | Deer | Deer |
| STDR | Dry stock | Dry stock |
| STDY | Dairy | Dairy |
| STHO | Horses | Horses |
| STSH | Sheep | Sheep |
| STSU | Sucklers | Sucklers |
| VE | Vegetables | Vegetables |
| VEGE | Brassicas, carrots, peas, beans | Brassicas, pulses |

### *Table S_CompactDegree*

| IndexCol | CompactDegreeCode | CompactDegreeText | CompactDegreeDesc |
|---|---|---|---|
| 1 | N | Non-cemented and non-compacted | No evidence of cementation or compaction |
| 2 | Y | Non-cemented but compacted | Compacted mass is appreciably harder or more brittle than other comparable soil mass |
| 3 | W | Weakly cemented | Cemented mass is brittle and hard but can be broken in hands |
| 4 | M | Moderately cemented | Cemented mass cannot be broken in hands but is discontinuous |
| 5 | C | Cemented | Cemented mass cannot be broken in hands and is continuous |
| 6 | I | Indurated | Cemented mass cannot be broken by the body weight of a soil surveyor |

### *Table S_CompactNature*

| IndexCol | CompactNatureCode | CompactNatureText |
|---|---|---|
| 1 | K | Carbonates |
| 2 | FE | Iron |
| 3 | FM | Iron-Manganese |
| 4 | C | Clay |
| 5 | CS | Clay-sesquioxides |
| 6 | M | Mechanical |

| | | |
|---|---|---|
| 7 | P | Ploughing |
| 8 | NK | Not known |

### *Table S_ConsistenceDry*

| IndexCol | ConsistDryCode | ConsistDryText | ConsistDryDesc |
|---|---|---|---|
| 1 | LO | Loose | Non-coherent |
| 2 | SO | Soft | Very weakly coherent and fragile. Breaks to powder or individual grains under very slight pressure |
| 3 | SHA | Slightly hard | Weakly resistant to pressure; easily broken between thumb and forefinger |
| 4 | HA | Hard | Moderately resistant to pressure; can be broken in the hands, not breakable between thumb and forefinger |
| 5 | VHA | Very hard | Very resistant to pressure; can be broken in the hands with difficulty |
| 6 | EHA | Extremely hard | Extremely resistant to pressure; cannot be broken in the hands |

### *Table S_ConsistenceMoist*

| IndexCol | ConsistMoistCode | ConsistMoistText | ConsistMoistDesc |
|---|---|---|---|
| 1 | LO | Loose | Non-coherent |
| 2 | VFR | Very friable | Crushes under very gentle pressure, but coheres when pressed together |
| 3 | FR | Friable | Crushes under gentle to moderate pressure between thumb and forefinger and coheres when pressed together |
| 4 | FI | Firm | Crushes under moderate pressure between thumb and forefinger;  resistance is noticeable |
| 5 | VFI | Very firm | Crushes under strong pressure; barely crushable between thumb and forefinger |
| 6 | EFI | Extremely firm | Crushes under only very strong pressure; cannot be crushed between thumb and forefinger |

### *Table S_Contrast*

| ContrastCode | ContrastText |
|---|---|
| F | Faint |
| D | Distinct |
| P | Prominent |

### *Table S_Erosion*

| ErosionCode | ErosionText |
|---|---|
| gul | Gully |
| ril | Rill |
| sht | Sheet |
| wnd | Wind |

### *Table S_Facet*

| FacetCode | FacetText |
|---|---|
| BO | Bottom |
| CR | Crest |
| LS | Lower slope |
| MS | Middle slope |
| TS | Toe slope |
| UP | Upper slope |

### *Table S_FEJARAbundance*

| IndexCol | FeJarAbundCode | FeJarAbundText | FEmn |
|---|---|---|---|
| 1 | N | 0 % | N 0 % |
| 2 | VF | 0-2 % | VF 0-2 % |
| 3 | F | 2-5 % | F 2-5 % |
| 4 | C | 5-15 % | C 5-15 % |
| 5 | M | 15-40 % | M 15-40 % |
| 6 | A | > 40 % | A > 40 % |

### *Table S_Fibre*

| FibreCode | FibreText |
|---|---|
| F | Fibrous Peat |
| H | Humified Peat |
| M | Mesic (semi-fibrous) Peat |

### *Table S_Fissures*

| IndexCol | FissuresCode | FissuresText | FissuresPC | Fissures |
|---|---|---|---|---|
| 1 | F | | < 1mm | F < 1mm |
| 2 | M | | 1-2 mm | M 1-2 mm |
| 3 | W | | 2-5 mm | W 2-5 mm |
| 4 | VW | | 5-10 mm | VW 5-10 mm |
| 5 | EW | | > 10mm | EW > 10mm |

### *Table S_Human*

| IndexCol | HumanCode | HumanText |
|---|---|---|
| 1 | FE | Fertilizer applications |
| 2 | PL | Ploughing |
| 3 | SL | Slurry applications |
| 4 | AD | Artificial drainage |
| 5 | CA | Cut-away |
| 6 | CL | Clearing |
| 7 | CU | Cut-over (peat) |
| 8 | DI | Ditching |
| 9 | HN | No influence |
| 10 | LV | Levelling |
| 11 | MI | Milled (peat) |
| 12 | MO | Organic additions |
| 13 | MP | Plaggen |
| 14 | MS | Sand additions |
| 15 | NK | Not known |
| 16 | PO | Pollution |
| 17 | SC | Surface compaction |
| 18 | TE | Terracing |
| 19 | LI | Liming |
| 20 | RI | Ridging |
| 21 | SE | Seeded/reseeded |
| 22 | SP | Sprayed (herbicides) |
| 23 | HA | Harvested (tillage) |

### *Table S_Landform*

| LandformCode | LandformText |
|---|---|
| AF | Alluvial floodplain |
| AP | Alluvial Plain |
| AT | Alluvial terrace |
| BA | Basin |
| CB | Beach ridge |
| CF | Tidal flats |
| CP | Coastal plain |
| DR | Drumlins |
| DU | Dune |
| HI | Hill |
| KA | Karst |
| KK | Kame and kettle |
| MO | Mountain |
| PL | Lacustrine Plain |
| PN | Plain |

| | |
|---|---|
| PU | Plateau |
| UN | Undulating |
| VA | Valley |

### *Table S_Landuse*

| IndexCol | LanduseCode | LanduseText | LanduseAbbrev |
|---|---|---|---|
| 1 | AR | Arable | Arable |
| 2 | GI | Grassland improved | Grass_Improve |
| 3 | GU | Grassland unimproved | Grass_Unimprove |
| 4 | HO | Horticulture | Horticulture |
| 5 | FO | Forestry | Forestry |
| 6 | WM | Woodland  managed | Woods_Manage |
| 7 | WN | Woodland native | Woods_Native |
| 8 | SC | Scrub | Scrub |
| 9 | BO | Blanket bog | Blanket bog |
| 10 | FN | Fen | Fen |
| 11 | HW | Heath wet | Heath wet |
| 12 | HD | Heath dry | Heath dry |
| 13 | MS | Salt marsh | Salt marsh |
| 14 | MH | Marsh | Marsh |

### *Table S_Macropores*

| IndexCol | MacroporesCode | MacroporesText | MacroporesPC | Macropores |
|---|---|---|---|---|
| 1 | VF | | < 0.5mm | VF < 0.5mm |
| 2 | F | | 0.5-2 mm | F 0.5-2 mm |
| 3 | M | | 2-5 mm | M 2-5 mm |
| 4 | C | | 5-20 mm | C 5-20 mm |
| 5 | VC | | 20-50mm | VC 20-50mm |

### *Table S_MapSheet*

| MapSheet |
|---|
| B60 |
| B61 |
| B70 |
| B71 |
| B72 |
| B73 |
| B80 |
| B81 |
| B82 |
| B83 |
| B84 |
| B90 |
| B91 |
| B92 |
| B93 |
| B94 |
| C00 |
| C01 |
| C02 |
| C03 |
| C04 |
| C10 |
| C11 |
| C12 |
| C13 |
| C14 |
| C20 |
| C21 |
| C22 |
| C23 |
| C24 |
| C30 |

| | | |
|---|---|---|
| C31 | G11 | G78 |
| C32 | G12 | G79 |
| C33 | G13 | G80 |
| C34 | G14 | G81 |
| C35 | G20 | G82 |
| C42 | G21 | G83 |
| C43 | G22 | G84 |
| C44 | G23 | G85 |
| C45 | G30 | G86 |
| C52 | G31 | G87 |
| C53 | G32 | G88 |
| C54 | G33 | G89 |
| C55 | G40 | G90 |
| C63 | G41 | G91 |
| C64 | G42 | G92 |
| F50 | G43 | G93 |
| F51 | G47 | G94 |
| F52 | G48 | G95 |
| F60 | G50 | G96 |
| F61 | G51 | G97 |
| F62 | G52 | G98 |
| F63 | G53 | G99 |
| F64 | G54 | H00 |
| F70 | G55 | H01 |
| F71 | G57 | H02 |
| F72 | G58 | H03 |
| F73 | G59 | H04 |
| F74 | G60 | H06 |
| F80 | G61 | H07 |
| F81 | G62 | H08 |
| F82 | G63 | H09 |
| F83 | G64 | H10 |
| F84 | G65 | H11 |
| F90 | G67 | H12 |
| F91 | G68 | H16 |
| F92 | G69 | H17 |
| F93 | G70 | H18 |
| F94 | G71 | H19 |
| G00 | G72 | H20 |
| G01 | G73 | H21 |
| G02 | G74 | H22 |
| G03 | G75 | H28 |
| G04 | G76 | H29 |
| G10 | G77 | H30 |

| | | |
|---|---|---|
| H31 | L69 | M16 |
| H32 | L71 | M17 |
| H39 | L72 | M18 |
| H40 | L73 | M19 |
| H41 | L74 | M20 |
| H42 | L75 | M21 |
| H50 | L76 | M22 |
| H51 | L77 | M23 |
| H52 | L78 | M24 |
| H53 | L79 | M25 |
| H54 | L80 | M26 |
| H60 | L81 | M27 |
| H61 | L82 | M28 |
| H62 | L83 | M29 |
| H63 | L84 | M30 |
| H64 | L85 | M31 |
| H65 | L86 | M32 |
| H70 | L87 | M33 |
| H71 | L88 | M34 |
| H72 | L89 | M35 |
| H73 | L90 | M36 |
| H74 | L92 | M37 |
| H80 | L93 | M38 |
| H81 | L94 | M39 |
| H82 | L95 | M40 |
| H90 | L96 | M41 |
| H91 | L97 | M42 |
| J00 | L98 | M43 |
| J01 | L99 | M44 |
| J10 | M00 | M45 |
| J11 | M02 | M46 |
| J20 | M03 | M47 |
| J21 | M04 | M48 |
| L46 | M05 | M49 |
| L54 | M06 | M50 |
| L55 | M07 | M51 |
| L56 | M08 | M52 |
| L57 | M09 | M53 |
| L63 | M10 | M54 |
| L64 | M11 | M55 |
| L65 | M12 | M56 |
| L66 | M13 | M57 |
| L67 | M14 | M58 |
| L68 | M15 | M59 |

| | | |
|---|---|---|
| M60 | N04 | N48 |
| M61 | N05 | N49 |
| M62 | N06 | N50 |
| M63 | N07 | N51 |
| M64 | N08 | N52 |
| M65 | N09 | N53 |
| M66 | N10 | N54 |
| M67 | N11 | N55 |
| M68 | N12 | N56 |
| M69 | N13 | N57 |
| M70 | N14 | N58 |
| M71 | N15 | N59 |
| M72 | N16 | N60 |
| M73 | N17 | N61 |
| M74 | N18 | N62 |
| M75 | N19 | N63 |
| M76 | N20 | N64 |
| M77 | N21 | N65 |
| M78 | N22 | N66 |
| M79 | N23 | N67 |
| M80 | N24 | N68 |
| M81 | N25 | N69 |
| M82 | N26 | N70 |
| M83 | N27 | N71 |
| M84 | N28 | N72 |
| M85 | N29 | N73 |
| M86 | N30 | N74 |
| M87 | N31 | N75 |
| M88 | N32 | N76 |
| M89 | N33 | N77 |
| M90 | N34 | N78 |
| M91 | N35 | N79 |
| M92 | N36 | N80 |
| M93 | N37 | N81 |
| M94 | N38 | N82 |
| M95 | N39 | N83 |
| M96 | N40 | N84 |
| M97 | N41 | N85 |
| M98 | N42 | N86 |
| M99 | N43 | N87 |
| N00 | N44 | N88 |
| N01 | N45 | N89 |
| N02 | N46 | N90 |
| N03 | N47 | N91 |

| | | |
|---|---|---|
| N92 | Q41 | R15 |
| N93 | Q50 | R16 |
| N94 | Q51 | R17 |
| N95 | Q60 | R18 |
| N96 | Q61 | R19 |
| N97 | Q62 | R20 |
| N98 | Q63 | R21 |
| N99 | Q64 | R22 |
| O00 | Q70 | R23 |
| O01 | Q71 | R24 |
| O02 | Q72 | R25 |
| O03 | Q73 | R26 |
| O04 | Q74 | R27 |
| O05 | Q75 | R28 |
| O06 | Q80 | R29 |
| O07 | Q81 | R30 |
| O08 | Q82 | R31 |
| O09 | Q83 | R32 |
| O10 | Q84 | R33 |
| O11 | Q85 | R34 |
| O12 | Q86 | R35 |
| O13 | Q90 | R36 |
| O14 | Q91 | R37 |
| O15 | Q92 | R38 |
| O16 | Q93 | R39 |
| O17 | Q94 | R40 |
| O18 | Q95 | R41 |
| O19 | Q96 | R42 |
| O20 | Q97 | R43 |
| O21 | R00 | R44 |
| O22 | R01 | R45 |
| O23 | R02 | R46 |
| O24 | R03 | R47 |
| O25 | R04 | R48 |
| O26 | R05 | R49 |
| O30 | R06 | R50 |
| O31 | R07 | R51 |
| O33 | R08 | R52 |
| O34 | R09 | R53 |
| O35 | R10 | R54 |
| Q20 | R11 | R55 |
| Q30 | R12 | R56 |
| Q31 | R13 | R57 |
| Q40 | R14 | R58 |

| | | |
|---|---|---|
| R59 | S03 | S47 |
| R60 | S04 | S48 |
| R61 | S05 | S49 |
| R62 | S06 | S50 |
| R63 | S07 | S51 |
| R64 | S08 | S52 |
| R65 | S09 | S53 |
| R66 | S10 | S54 |
| R67 | S11 | S55 |
| R68 | S12 | S56 |
| R69 | S13 | S57 |
| R70 | S14 | S58 |
| R71 | S15 | S59 |
| R72 | S16 | S60 |
| R73 | S17 | S61 |
| R74 | S18 | S62 |
| R75 | S19 | S63 |
| R76 | S20 | S64 |
| R77 | S21 | S65 |
| R78 | S22 | S66 |
| R79 | S23 | S67 |
| R80 | S24 | S68 |
| R81 | S25 | S69 |
| R82 | S26 | S70 |
| R83 | S27 | S71 |
| R84 | S28 | S72 |
| R85 | S29 | S73 |
| R86 | S30 | S74 |
| R87 | S31 | S75 |
| R88 | S32 | S76 |
| R89 | S33 | S77 |
| R90 | S34 | S78 |
| R91 | S35 | S79 |
| R92 | S36 | S80 |
| R93 | S37 | S81 |
| R94 | S38 | S82 |
| R95 | S39 | S83 |
| R96 | S40 | S84 |
| R97 | S41 | S85 |
| R98 | S42 | S86 |
| R99 | S43 | S87 |
| S00 | S44 | S88 |
| S01 | S45 | S89 |
| S02 | S46 | S90 |

| | | |
|---|---|---|
| S91 | V44 | V99 |
| S92 | V45 | W02 |
| S93 | V46 | W03 |
| S94 | V47 | W04 |
| S95 | V48 | W05 |
| S96 | V49 | W06 |
| S97 | V53 | W07 |
| S98 | V54 | W08 |
| S99 | V55 | W09 |
| T00 | V56 | W12 |
| T01 | V57 | W13 |
| T02 | V58 | W14 |
| T03 | V59 | W15 |
| T04 | V63 | W16 |
| T05 | V64 | W17 |
| T06 | V65 | W18 |
| T07 | V66 | W19 |
| T08 | V67 | W23 |
| T09 | V68 | W24 |
| T10 | V69 | W25 |
| T11 | V72 | W26 |
| T12 | V73 | W27 |
| T13 | V74 | W28 |
| T14 | V75 | W29 |
| T15 | V76 | W33 |
| T16 | V77 | W34 |
| T17 | V78 | W35 |
| T18 | V79 | W36 |
| T19 | V82 | W37 |
| T24 | V83 | W38 |
| T25 | V84 | W39 |
| T26 | V85 | W43 |
| T27 | V86 | W44 |
| T28 | V87 | W45 |
| T29 | V88 | W46 |
| T37 | V89 | W47 |
| T38 | V91 | W48 |
| T39 | V92 | W49 |
| V19 | V93 | W53 |
| V29 | V94 | W54 |
| V36 | V95 | W55 |
| V37 | V96 | W56 |
| V39 | V97 | W57 |
| V43 | V98 | W58 |

| | | |
|---|---|---|
| W59 | W85 | X18 |
| W63 | W86 | X19 |
| W64 | W87 | X27 |
| W65 | W88 | X28 |
| W66 | W89 | X29 |
| W67 | W96 | X38 |
| W68 | W97 | X39 |
| W69 | W98 | X49 |
| W74 | W99 | X59 |
| W75 | X06 | X69 |
| W76 | X07 | X79 |
| W77 | X08 | X99 |
| W78 | X09 | Y90 |
| W79 | X17 | |

### *Table S_MottleAbundance*

| IndexCol | MottleAbundCode | MottleAbundPC | MottleAbundText | Mot_Abun |
|---|---|---|---|---|
| 1 | N | 0 % | None | N 0 % |
| 2 | VF | 0-2 % | Very few | VF 0-2 % |
| 3 | F | 2-5 % | Few | F 2-5 % |
| 4 | C | 5-15 % | Common | C 5-15 % |
| 5 | M | 15-40 % | Many | M 15-40 % |
| 6 | A | > 40 % | Abundant | A > 40 % |

### *Table S_MottleSharpeness*

| IndexCol | MottleSharpCode | MottleSharpPC | MottleSharpText | Mot_Sharp |
|---|---|---|---|---|
| 1 | S | Sharp | < 0.5 mm | S < 0.5 mm |
| 2 | C | Clear | 0.5-2 mm | C 0.5-2 mm |
| 3 | D | Diffuse | > 2 mm | D > 2 mm |

### *Table S_MottleSize*

| IndexCol | MottleSizeCode | MottleSizePC | MottleSizeText | Mot_Size |
|---|---|---|---|---|
| 1 | VF | < 2mm | Very Fine | VF <2mm |
| 2 | F | 2-6mm | Fine | F 2-6mm |
| 3 | M | 6-20mm | Medium | M 6-20mm |
| 4 | A | > 20mm | Coarse | A >20mm |

***Table S_munsell***

| Index | LISTVALUE | HUEVC | HUE | VALUE | CHROMA | MUNSELL_CO | 2009_Book | PCCS_COLOU | JIS_COLOUR |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | None | | | | | | | |
| 2 | | 10B251 | 10B | 2.5 | 1 | | bluish black | | |
| 3 | | 10B31 | 10B | 3 | 1 | | very dark bluish grey | | |
| 4 | | 10B41 | 10B | 4 | 1 | | dark bluish grey | | |
| 5 | | 10B51 | 10B | 5 | 1 | | bluish grey | | |
| 6 | | 10B61 | 10B | 6 | 1 | | bluish grey | | |
| 7 | | 10B71 | 10B | 7 | 1 | | light bluish grey | | |
| 8 | | 10B81 | 10B | 8 | 1 | | light bluish grey | | |
| 9 | 6 | 10BG61 | 10BG | 6 | 1 | | greenish grey | light greyish green | bluish grey |
| 10 | 7 | 10BG71 | 10BG | 7 | 1 | | light greenish grey | light greyish green | light bluish grey |
| 13 | | 10G251 | 10G | 2.5 | 1 | | greenish black | | |
| 14 | 10 | 10G31 | 10G | 3 | 1 | | very dark greenish grey | dark greyish green | dark greenish grey |
| 15 | 11 | 10G41 | 10G | 4 | 1 | | dark greenish grey | greyish green | dark greenish grey |
| 16 | 12 | 10G51 | 10G | 5 | 1 | | greenish grey | greyish green | greenish grey |
| 17 | 13 | 10G61 | 10G | 6 | 1 | | greenish grey | light greyish green | greenish grey |
| 18 | 14 | 10G71 | 10G | 7 | 1 | | light greenish grey | light greyish green | light greenish grey |
| 20 | | 10GY251 | 10GY | 2.5 | 1 | | greenish black | | |
| 21 | 16 | 10GY31 | 10GY | 3 | 1 | | very dark greenish grey | dark greyish green | dark greenish grey |
| 22 | 17 | 10GY41 | 10G | 4 | 1 | | dark | greyish | dark |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Y | | | | greenish grey | green | greenish grey |
| 23 | 18 | 10GY51 | 10GY | 5 | 1 | | greenish grey | greyish green | greenish grey |
| 24 | 19 | 10GY61 | 10GY | 6 | 1 | | greenish grey | greyish leaf | greenish grey |
| 25 | 20 | 10GY71 | 10GY | 7 | 1 | | light greenish grey | greyish leaf | light greenish grey |
| 26 | 21 | 10GY81 | 10GY | 8 | 1 | | light greenish grey | pale yellow green | light greenish grey |
| 31 | | 10R251 | 10R | 2.5 | 1 | | reddish black | | |
| 32 | | 10R252 | 10R | 2.5 | 2 | | very dusky red | | |
| 33 | 26 | 10R31 | 10R | 3 | 1 | dark reddish grey | dark reddish grey | dark greyish brown | dark reddish grey |
| 34 | 27 | 10R32 | 10R | 3 | 2 | dusky red | dusky red | dark greyish brown | dark reddish brown |
| 35 | 28 | 10R33 | 10R | 3 | 3 | dusky red | dusky red | dark greyish brown | dark reddish brown |
| 36 | 29 | 10R34 | 10R | 3 | 4 | dusky red | dusky red | reddish brown | dark red |
| 37 | 30 | 10R36 | 10R | 3 | 6 | dark red | dark red | reddish brown | dark red |
| 38 | 31 | 10R41 | 10R | 4 | 1 | dark reddish grey | dark reddish grey | greyish brown | dark reddish grey |
| 39 | 32 | 10R42 | 10R | 4 | 2 | weak red | weak red | greyish brown | greyish red |
| 40 | 33 | 10R43 | 10R | 4 | 3 | weak red | weak red | greyish brown | reddish brown |
| 41 | 34 | 10R44 | 10R | 4 | 4 | weak red | weak red | reddish brown | reddish brown |
| 42 | 35 | 10R46 | 10R | 4 | 6 | red | red | reddish brown | red |
| 43 | 36 | 10R48 | 10R | 4 | 8 | red | red | deep reddish brown | red |
| 44 | 37 | 10R51 | 10R | 5 | 1 | reddish grey | reddish grey | greyish brown | reddish grey |
| 45 | 38 | 10R52 | 10R | 5 | 2 | weak red | weak red | greyish brown | greyish red |
| 46 | 39 | 10R53 | 10R | 5 | 3 | weak red | weak red | greyish brown | reddish brown |
| 47 | 40 | 10R54 | 10R | 5 | 4 | weak red | weak red | light | reddish |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | reddish brown | brown |
| 48 | 41 | 10R56 | 10R | 5 | 6 | red | red | light reddish brown | red |
| 49 | 42 | 10R58 | 10R | 5 | 8 | red | red | strong reddish orange | red |
| 50 | 43 | 10R61 | 10R | 6 | 1 | reddish grey | reddish grey | greyish brown | reddish grey |
| 51 | 44 | 10R62 | 10R | 6 | 2 | pale red | pale red | greyish brown | greyish red |
| 52 | 45 | 10R63 | 10R | 6 | 3 | pale red | pale red | greyish brown | dull reddish orange |
| 53 | 46 | 10R64 | 10R | 6 | 4 | pale red | pale red | light reddish brown | dull reddish orange |
| 54 | 47 | 10R66 | 10R | 6 | 6 | light red | light red | light reddish brown | reddish orange |
| 55 | 48 | 10R68 | 10R | 6 | 8 | light red | light red | strong reddish orange | reddish orange |
| 56 | 49 | 10R71 | 10R | 7 | 1 | | light grey | greyish pink | light reddish grey |
| 57 | | 10R72 | 10R | 7 | 2 | | pale red | | |
| 58 | | 10R73 | 10R | 7 | 3 | | pale red | | |
| 59 | | 10R74 | 10R | 7 | 4 | | pale red | | |
| 60 | | 10R76 | 10R | 7 | 6 | | light red | | |
| 61 | | 10R78 | 10R | 7 | 8 | | light red | | |
| 62 | | 10R81 | 10R | 8 | 1 | | white | | |
| 63 | | 10R82 | 10R | 8 | 2 | | pinkish white | | |
| 64 | | 10R83 | 10R | 8 | 3 | | pink | | |
| 65 | | 10R84 | 10R | 8 | 4 | | pink | | |
| 67 | | 10Y251 | 10Y | 2.5 | 1 | | greenish black | | |
| 68 | 51 | 10Y31 | 10Y | 3 | 1 | | very dark greenish black | greyish olive | olive black |
| 69 | 52 | 10Y32 | 10Y | 3 | 2 | | very dark greyish olive | greyish olive | olive black |
| 70 | | 10Y34 | 10Y | 3 | 4 | | dark olive | | |
| 71 | 53 | 10Y41 | 10Y | 4 | 1 | | dark greenish grey | greyish olive | grey |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 72 | 54 | 10Y42 | 10Y | 4 | 2 | | dark greyish olive | greyish olive | olive grey |
| 73 | | 10Y44 | 10Y | 4 | 4 | | olive | | |
| 74 | 55 | 10Y51 | 10Y | 5 | 1 | | greenish grey | greyish olive | grey |
| 75 | 56 | 10Y52 | 10Y | 5 | 2 | | greyish olive | greyish olive | olive grey |
| 76 | | 10Y54 | 10Y | 5 | 4 | | light olive | | |
| 77 | 57 | 10Y61 | 10Y | 6 | 1 | | greenish grey | greyish yellow | grey |
| 78 | 58 | 10Y62 | 10Y | 6 | 2 | | light greyish olive | greyish yellow | olive grey |
| 79 | | 10Y64 | 10Y | 6 | 4 | | pale olive | | |
| 80 | 59 | 10Y71 | 10Y | 7 | 1 | | light greenish grey | greyish yellow | light grey |
| 82 | 61 | 10Y81 | 10Y | 8 | 1 | | light greenish grey | greyish yellow | light grey |
| 85 | 64 | 10YR21 | 10YR | 2 | 1 | black | black | dark greyish brown | black |
| 86 | 65 | 10YR22 | 10YR | 2 | 2 | very dark brown | very dark brown | dark greyish brown | brownish black |
| 88 | 67 | 10YR31 | 10YR | 3 | 1 | very dark grey | very dark grey | dark greyish brown | brownish black |
| 89 | 68 | 10YR32 | 10YR | 3 | 2 | very dark greyish brown | very dark greyish brown | dark greyish brown | brownish black |
| 90 | 69 | 10YR33 | 10YR | 3 | 3 | dark brown | dark brown | dark yellowish brown | dark brown |
| 91 | 70 | 10YR34 | 10YR | 3 | 4 | dark yellowish brown | dark yellowish brown | dark yellowish brown | dark brown |
| 92 | | 10YR36 | 10YR | 3 | 6 | | dark yellowish brown | | |
| 93 | 71 | 10YR41 | 10YR | 4 | 1 | dark grey | dark grey | greyish brown | brownish grey |
| 94 | 72 | 10YR42 | 10YR | 4 | 2 | dark greyish brown | dark greyish brown | greyish brown | greyish yellow brown |
| 95 | 73 | 10YR43 | 10YR | 4 | 3 | dark brown | brown | greyish brown | dull yellowish brown |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 96 | 74 | 10YR44 | 10YR | 4 | 4 | dark yellowish brown | dark yellowish brown | yellowish brown | brown |
| 97 | 75 | 10YR46 | 10YR | 4 | 6 | | dark yellowish brown | yellowish brown | brown |
| 98 | 76 | 10YR51 | 10YR | 5 | 1 | grey | grey | greyish brown | brownish grey |
| 99 | 77 | 10YR52 | 10YR | 5 | 2 | greyish brown | greyish brown | greyish brown | greyish yellow brown |
| 100 | 78 | 10YR53 | 10YR | 5 | 3 | brown | brown | greyish brown | dull yellowish brown |
| 101 | 79 | 10YR54 | 10YR | 5 | 4 | yellowish brown | yellowish brown | yellowish brown | dull yellowish brown |
| 102 | 80 | 10YR56 | 10YR | 5 | 6 | yellowish brown | yellowish brown | yellowish brown | yellowish brown |
| 103 | 81 | 10YR58 | 10YR | 5 | 8 | yellowish brown | yellowish brown | brownish gold | yellowish brown |
| 104 | 82 | 10YR61 | 10YR | 6 | 1 | grey | grey | beige | brownish grey |
| 105 | 83 | 10YR62 | 10YR | 6 | 2 | light brownish grey | light brownish grey | beige | greyish yellow brown |
| 106 | 84 | 10YR63 | 10YR | 6 | 3 | pale brown | pale brown | beige | dull yellow orange |
| 107 | 85 | 10YR64 | 10YR | 6 | 4 | light yellowish brown | light yellowish brown | light yellowish brown | dull yellow orange |
| 108 | 86 | 10YR66 | 10YR | 6 | 6 | brownish yellow | brownish yellow | light yellowish brown | bright yellowish brown |
| 109 | 87 | 10YR68 | 10YR | 6 | 8 | brownish yellow | brownish yellow | gold | bright yellowish brown |
| 110 | 88 | 10YR71 | 10YR | 7 | 1 | light grey | light grey | beige | light grey |
| 111 | 89 | 10YR72 | 10YR | 7 | 2 | light grey | light grey | beige | dull yellow orange |
| 112 | 90 | 10YR73 | 10YR | 7 | 3 | very pale brown | very pale brown | beige | dull yellow orange |
| 113 | 91 | 10YR74 | 10YR | 7 | 4 | very pale brown | very pale brown | dull orange yellow | dull yellow orange |
| 114 | 92 | 10YR76 | 10Y | 7 | 6 | yellow | yellow | dull orange | bright |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | R | | | | | yellow | yellowish brown |
| 115 | 93 | 10YR78 | 10YR | 7 | 8 | yellow | yellow | gold | yellow orange |
| 116 | 94 | 10YR81 | 10YR | 8 | 1 | white | white | pale beige | light grey |
| 117 | 95 | 10YR82 | 10YR | 8 | 2 | white | very pale brown | pale beige | light grey |
| 118 | 96 | 10YR83 | 10YR | 8 | 3 | very pale brown | very pale brown | pale beige | light yellow orange |
| 119 | 97 | 10YR84 | 10YR | 8 | 4 | very pale brown | very pale brown | dull orange yellow | light yellow orange |
| 122 | 98 | 10YR86 | 10YR | 8 | 6 | yellow | yellow | dull orange yellow | yellow orange |
| 123 | 99 | 10YR88 | 10YR | 8 | 8 | yellow | yellow | strong orange yellow | yellow orange |
| 136 | | 25Y251 | 25Y | 2.5 | 1 | | black | | |
| 137 | 108 | 25Y31 | 25Y | 3 | 1 | | very dark grey | greyish olive | brownish black |
| 138 | 109 | 25Y32 | 25Y | 3 | 2 | very dark greyish brown | very dark greyish brown | greyish olive | brownish black |
| 139 | 110 | 25Y33 | 25Y | 3 | 3 | | dark olive brown | dark brownish olive | dark olive |
| 140 | 111 | 25Y41 | 25Y | 4 | 1 | | dark grey | greyish olive | yellowish grey |
| 141 | 112 | 25Y42 | 25Y | 4 | 2 | dark greyish brown | dark greyish brown | greyish olive | dark greyish yellow |
| 142 | 113 | 25Y43 | 25Y | 4 | 3 | | olive brown | greyish olive | olive brown |
| 143 | 114 | 25Y44 | 25Y | 4 | 4 | olive brown | olive brown | brownish olive | olive brown |
| 145 | 116 | 25Y51 | 25Y | 5 | 1 | | grey | greyish olive | yellowish grey |
| 146 | 117 | 25Y52 | 25Y | 5 | 2 | greyish brown | greyish brown | greyish olive | dark greyish yellow |
| 147 | 118 | 25Y53 | 25Y | 5 | 3 | | light olive brown | greyish olive | yellowish brown |
| 148 | 119 | 25Y54 | 25Y | 5 | 4 | light olive brown | light olive brown | brownish olive | yellowish brown |
| 149 | 120 | 25Y56 | 25Y | 5 | 6 | light olive brown | light olive brown | brownish olive | yellowish brown |
| 150 | 121 | 25Y61 | 25Y | 6 | 1 | | grey | greyish yellow | yellowish grey |

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| 151 | 122 | 25Y62 | 25Y | 6 | 2 | light brownish grey | light brownish grey | greyish yellow | greyish yellow |
| 152 | 123 | 25Y63 | 25Y | 6 | 3 | | light yellowish brown | greyish yellow | dull yellow |
| 153 | 124 | 25Y64 | 25Y | 6 | 4 | light yellowish brown | light yellowish brown | dark yellow | dull yellow |
| 154 | 125 | 25Y66 | 25Y | 6 | 6 | olive yellow | olive yellow | dark yellow | bright yellowish brown |
| 155 | 126 | 25Y68 | 25Y | 6 | 8 | olive yellow | olive yellow | gold | bright yellowish brown |
| 156 | 127 | 25Y71 | 25Y | 7 | 1 | | light grey | greyish yellow | light grey |
| 157 | 128 | 25Y72 | 25Y | 7 | 2 | light grey | light grey | greyish yellow | greyish yellow |
| 158 | 129 | 25Y73 | 25Y | 7 | 3 | | pale brown | greyish yellow | light yellow |
| 159 | 130 | 25Y74 | 25Y | 7 | 4 | pale yellow | pale brown | dull orange yellow | light yellow |
| 160 | 131 | 25Y76 | 25Y | 7 | 6 | yellow | yellow | dull orange yellow | bright yellowish brown |
| 161 | 132 | 25Y78 | 25Y | 7 | 8 | yellow | yellow | gold | yellow |
| 162 | 133 | 25Y81 | 25Y | 8 | 1 | | white | greyish yellow | light grey |
| 163 | 134 | 25Y82 | 25Y | 8 | 2 | white | pale brown | greyish yellow | light grey |
| 164 | 135 | 25Y83 | 25Y | 8 | 3 | | pale brown | greyish yellow | pale yellow |
| 165 | 136 | 25Y84 | 25Y | 8 | 4 | pale yellow | pale brown | dull orange yellow | pale yellow |
| 168 | 137 | 25Y86 | 25Y | 8 | 6 | yellow | yellow | dull orange yellow | yellow |
| 169 | 138 | 25Y88 | 25Y | 8 | 8 | yellow | yellow | strong orange yellow | yellow |
| 179 | | 25YR25 1 | 25Y R | 2.5 | 1 | | reddish black | | |
| 180 | | 25YR25 2 | 25Y R | 2.5 | 2 | | very dusky red | | |
| 181 | | 25YR25 3 | 25Y R | 2.5 | 3 | | dark reddish brown | | |
| 182 | | 25YR25 4 | 25Y R | 2.5 | 4 | | dark reddish brown | | |

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| 183 | 144 | 25YR31 | 25YR | 3 | 1 | | dark reddish grey | dark greyish brown | dark reddish grey |
| 184 | 145 | 25YR32 | 25YR | 3 | 2 | dusky red | dusky red | dark greyish brown | dark reddish brown |
| 185 | 146 | 25YR33 | 25YR | 3 | 3 | | dark reddish brown | dark greyish brown | dark reddish brown |
| 186 | 147 | 25YR34 | 25YR | 3 | 4 | dark reddish brown | dark reddish brown | brown | dark reddish brown |
| 187 | 148 | 25YR36 | 25YR | 3 | 6 | dark red | dark red | brown | dark reddish brown |
| 188 | 149 | 25YR41 | 25YR | 4 | 1 | | dark reddish grey | greyish brown | reddish grey |
| 189 | 150 | 25YR42 | 25YR | 4 | 2 | weak red | weak red | greyish brown | greyish red |
| 190 | 151 | 25YR43 | 25YR | 4 | 3 | | reddish brown | greyish brown | dull reddish brown |
| 191 | 152 | 25YR44 | 25YR | 4 | 4 | reddish brown | reddish brown | brown | dull reddish brown |
| 192 | 153 | 25YR46 | 25YR | 4 | 6 | red | red | brown | reddish brown |
| 193 | 154 | 25YR48 | 25YR | 4 | 8 | red | red | deep reddish orange | reddish brown |
| 194 | 155 | 25YR51 | 25YR | 5 | 1 | | reddish grey | greyish brown | reddish grey |
| 195 | 156 | 25YR52 | 25YR | 5 | 2 | weak red | weak red | greyish brown | greyish red |
| 196 | 157 | 25YR53 | 25YR | 5 | 3 | | reddish brown | greyish brown | dull reddish brown |
| 197 | 158 | 25YR54 | 25YR | 5 | 4 | reddish brown | reddish brown | light brown | dull reddish brown |
| 198 | 159 | 25YR56 | 25YR | 5 | 6 | red | red | light brown | bright brown |
| 199 | 160 | 25YR58 | 25YR | 5 | 8 | red | red | strong reddish orange | bright brown |
| 200 | 161 | 25YR61 | 25YR | 6 | 1 | | reddish grey | pinkish beige | reddish grey |
| 201 | 162 | 25YR62 | 25YR | 6 | 2 | pale red | pale red | pinkish beige | greyish red |

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| 202 | 163 | 25YR63 | 25Y R | 6 | 3 | | light reddish brown | pinkish beige | dull orange |
| 203 | 164 | 25YR64 | 25Y R | 6 | 4 | light reddish brown | light reddish brown | light brown | dull orange |
| 204 | 165 | 25YR66 | 25Y R | 6 | 6 | light red | light red | light brown | orange |
| 205 | 166 | 25YR68 | 25Y R | 6 | 8 | light red | light red | strong reddish orange | orange |
| 206 | 167 | 25YR71 | 25Y R | 7 | 1 | | light reddish grey | pinkish beige | light reddish grey |
| 207 | 168 | 25YR72 | 25Y R | 7 | 2 | | pale red | pinkish beige | light reddish grey |
| 208 | 169 | 25YR73 | 25Y R | 7 | 3 | | light reddish brown | pinkish beige | pale reddish orange |
| 209 | 170 | 25YR74 | 25Y R | 7 | 4 | | light reddish brown | dull orange | pale reddish orange |
| 210 | 171 | 25YR76 | 25Y R | 7 | 6 | | light red | dull orange | orange |
| 211 | 172 | 25YR78 | 25Y R | 7 | 8 | | light red | light reddish orange | orange |
| 212 | | 25YR81 | 25Y R | 8 | 1 | | white | | |
| 213 | | 25YR82 | 25Y R | 8 | 2 | | pinkish white | | |
| 214 | | 25YR83 | 25Y R | 8 | 3 | | pink | | |
| 215 | | 25YR84 | 25Y R | 8 | 4 | | pink | | |
| 218 | | 5B251 | 5B | 2.5 | 1 | | bluish black | | |
| 219 | 175 | 5B31 | 5B | 3 | 1 | | very dark bluish grey | dark greyish blue | dark bluish grey |
| 220 | 176 | 5B41 | 5B | 4 | 1 | dark bluish grey | dark bluish grey | greyish blue | dark bluish grey |
| 221 | 177 | 5B51 | 5B | 5 | 1 | bluish grey | bluish grey | greyish blue | bluish grey |
| 222 | 178 | 5B61 | 5B | 6 | 1 | bluish grey | bluish grey | greyish blue | bluish grey |
| 223 | 179 | 5B71 | 5B | 7 | 1 | light bluish grey | light bluish | greyish sky | light bluish |

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| | | | | | | | grey | | grey |
| 224 | | 5B81 | 5B | 8 | 1 | | light bluish grey | | |
| 227 | | 5BG251 | 5BG | 2.5 | 1 | | greenish black | | |
| 228 | 182 | 5BG31 | 5BG | 3 | 1 | | very dark greenish grey | dark greyish green | dark bluish grey |
| 229 | 183 | 5BG41 | 5BG | 4 | 1 | dark greenish grey | dark greenish grey | greyish green | dark bluish grey |
| 230 | 184 | 5BG51 | 5BG | 5 | 1 | greenish grey | greenish grey | greyish green | bluish grey |
| 231 | 185 | 5BG61 | 5BG | 6 | 1 | greenish grey | greenish grey | light greyish green | bluish grey |
| 232 | 186 | 5BG71 | 5BG | 7 | 1 | light greenish grey | light greenish grey | light greyish green | light bluish grey |
| 233 | | 5BG81 | 5BG | 8 | 1 | | light greenish grey | | |
| 236 | | 5G251 | 5G | 2.5 | 1 | | greenish black | | |
| 237 | | 5G252 | 5G | 2.5 | 2 | | very dark greyish green | | |
| 238 | 189 | 5G31 | 5G | 3 | 1 | | very dark greenish grey | dark greyish green | dark greenish grey |
| 239 | | 5G32 | 5G | 3 | 2 | | very dark greenish grey | | |
| 240 | 190 | 5G41 | 5G | 4 | 1 | dark greenish grey | dark greenish grey | greyish green | dark greenish grey |
| 241 | 191 | 5G42 | 5G | 4 | 2 | greyish green | greyish green | | |
| 242 | 192 | 5G51 | 5G | 5 | 1 | greenish grey | greenish grey | greyish green | greenish grey |
| 243 | 193 | 5G52 | 5G | 5 | 2 | greyish green | greyish green | | |
| 244 | 194 | 5G61 | 5G | 6 | 1 | greenish grey | greenish grey | light greyish green | greenish grey |
| 245 | 195 | 5G62 | 5G | 6 | 2 | pale green | pale green | | |
| 246 | 196 | 5G71 | 5G | 7 | 1 | light greenish | light greenish | light greyish | light greenish |

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| | | | | | | grey | grey | green | grey |
| 247 | 197 | 5G72 | 5G | 7 | 2 | pale green | pale green | | |
| 248 | | 5G81 | 5G | 8 | 1 | | light greenish grey | | |
| 249 | | 5G82 | 5G | 8 | 2 | | pale green | | |
| 251 | | 5GY251 | 5GY | 2.5 | 1 | | greenish black | | |
| 252 | 199 | 5GY31 | 5GY | 3 | 1 | | very dark greenish grey | greyish olive green | dark olive grey |
| 253 | | 5GY32 | 5GY | 3 | 2 | | very dark greyish green | | |
| 254 | | 5GY34 | 5GY | 3 | 4 | | dark olive green | | |
| 255 | 200 | 5GY41 | 5GY | 4 | 1 | dark greenish grey | dark greenish grey | greyish olive green | dark olive grey |
| 256 | | 5GY42 | 5GY | 4 | 2 | | dark greyish green | | |
| 257 | | 5GY44 | 5GY | 4 | 4 | | olive green | | |
| 258 | 201 | 5GY51 | 5GY | 5 | 1 | greenish grey | greenish grey | greyish olive green | olive grey |
| 259 | | 5GY52 | 5GY | 5 | 2 | | greyish green | | |
| 260 | | 5GY54 | 5GY | 5 | 4 | | light olive green | | |
| 261 | 202 | 5GY61 | 5GY | 6 | 1 | greenish grey | greenish grey | greyish leaf | olive grey |
| 262 | | 5GY62 | 5GY | 6 | 2 | | light greyish green | | |
| 263 | | 5GY64 | 5GY | 6 | 4 | | pale yellowish green | | |
| 264 | 203 | 5GY71 | 5GY | 7 | 1 | light greenish grey | light greenish grey | greyish leaf | light olive grey |
| 265 | 204 | 5GY81 | 5GY | 8 | 1 | | light greenish grey | pale yellow green | light grey |
| 275 | | 5PB251 | 5PB | 2.5 | 1 | | bluish black | | |
| 276 | 214 | 5PB31 | 5PB | 3 | 1 | | very dark bluish | dark bluish grey | dark bluish |

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| | | | | | | | grey | | grey |
| 277 | 215 | 5PB41 | 5PB | 4 | 1 | | dark bluish grey | dark bluish grey | dark bluish grey |
| 278 | 216 | 5PB51 | 5PB | 5 | 1 | | bluish grey | bluish grey | bluish grey |
| 279 | 217 | 5PB61 | 5PB | 6 | 1 | | bluish grey | bluish grey | bluish grey |
| 280 | 218 | 5PB71 | 5PB | 7 | 1 | | light bluish grey | light bluish grey | light bluish grey |
| 281 | | 5PB81 | 5PB | 8 | 1 | | light bluish grey | | |
| 284 | | 5R251 | 5R | 2.5 | 1 | | reddish black | | |
| 285 | | 5R252 | 5R | 2.5 | 2 | | very dusky red | | |
| 286 | | 5R253 | 5R | 2.5 | 3 | | very dusky red | | |
| 287 | | 5R254 | 5R | 2.5 | 4 | | very dusky red | | |
| 288 | | 5R256 | 5R | 2.5 | 6 | | dark red | | |
| 289 | 221 | 5R31 | 5R | 3 | 1 | | dark reddish grey | dark greyish red | dark reddish grey |
| 290 | | 5R32 | 5R | 3 | 2 | | dusky red | | |
| 291 | | 5R33 | 5R | 3 | 3 | | dusky red | | |
| 292 | | 5R34 | 5R | 3 | 4 | | dusky red | | |
| 293 | | 5R36 | 5R | 3 | 6 | | dark red | | |
| 294 | | 5R38 | 5R | 3 | 8 | | dark red | | |
| 295 | 222 | 5R41 | 5R | 4 | 1 | | dark reddish grey | greyish red | dark reddish grey |
| 296 | | 5R42 | 5R | 4 | 2 | | weak red | | |
| 297 | | 5R43 | 5R | 4 | 3 | | weak red | | |
| 298 | | 5R44 | 5R | 4 | 4 | | weak red | | |
| 299 | | 5R46 | 5R | 4 | 6 | | red | | |
| 300 | | 5R48 | 5R | 4 | 8 | | red | | |
| 301 | 223 | 5R51 | 5R | 5 | 1 | | reddish grey | greyish red | reddish grey |
| 302 | | 5R52 | 5R | 5 | 2 | | weak red | | |
| 303 | | 5R53 | 5R | 5 | 3 | | weak red | | |
| 304 | | 5R54 | 5R | 5 | 4 | | weak red | | |
| 305 | | 5R56 | 5R | 5 | 6 | | red | | |
| 306 | | 5R58 | 5R | 5 | 8 | | red | | |
| 307 | 224 | 5R61 | 5R | 6 | 1 | | reddish grey | greyish red | reddish grey |

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| 308 | | 5R62 | 5R | 6 | 2 | | pale red | | |
| 309 | | 5R63 | 5R | 6 | 3 | | pale red | | |
| 310 | | 5R64 | 5R | 6 | 4 | | pale red | | |
| 311 | | 5R66 | 5R | 6 | 6 | | light red | | |
| 312 | | 5R68 | 5R | 6 | 8 | | light red | | |
| 313 | 225 | 5R71 | 5R | 7 | 1 | | pinkish grey | greyish pink | light reddish grey |
| 314 | | 5R72 | 5R | 7 | 2 | | pale red | | |
| 315 | | 5R73 | 5R | 7 | 3 | | pale red | | |
| 316 | | 5R74 | 5R | 7 | 4 | | pale red | | |
| 317 | | 5R76 | 5R | 7 | 6 | | light red | | |
| 318 | | 5R78 | 5R | 7 | 8 | | light red | | |
| 319 | | 5R81 | 5R | 8 | 1 | | white | | |
| 320 | | 5R82 | 5R | 8 | 2 | | light pink | | |
| 321 | | 5R83 | 5R | 8 | 3 | | light pink | | |
| 322 | | 5R84 | 5R | 8 | 4 | | light pink | | |
| 332 | | 5Y251 | 5Y | 2.5 | 1 | | black | | |
| 333 | | 5Y252 | 5Y | 2.5 | 2 | | black | | |
| 334 | 235 | 5Y31 | 5Y | 3 | 1 | very dark grey | very dark grey | greyish yellow | olive black |
| 335 | 236 | 5Y32 | 5Y | 3 | 2 | dark olive grey | dark olive grey | greyish yellow | olive black |
| 336 | 237 | 5Y41 | 5Y | 4 | 1 | dark grey | dark grey | greyish yellow | grey |
| 337 | 238 | 5Y42 | 5Y | 4 | 2 | olive grey | olive grey | greyish yellow | greyish olive |
| 338 | 239 | 5Y43 | 5Y | 4 | 3 | olive | olive | greyish yellow | dark olive |
| 339 | 240 | 5Y44 | 5Y | 4 | 4 | olive | olive | olive | dark olive |
| 340 | 241 | 5Y51 | 5Y | 5 | 1 | grey | grey | greyish yellow | grey |
| 341 | 242 | 5Y52 | 5Y | 5 | 2 | olive grey | olive grey | greyish yellow | greyish olive |
| 342 | 243 | 5Y53 | 5Y | 5 | 3 | olive | olive | greyish yellow | greyish olive |
| 343 | 244 | 5Y54 | 5Y | 5 | 4 | olive | olive | olive | olive |
| 344 | 245 | 5Y56 | 5Y | 5 | 6 | olive | olive | olive | olive |
| 345 | 246 | 5Y61 | 5Y | 6 | 1 | grey | grey | greyish yellow | grey |
| 346 | 247 | 5Y62 | 5Y | 6 | 2 | light olive grey | light olive grey | greyish yellow | greyish olive |
| 347 | 248 | 5Y63 | 5Y | 6 | 3 | pale olive | pale olive | greyish yellow | olive yellow |
| 348 | 249 | 5Y64 | 5Y | 6 | 4 | pale olive | pale olive | dark yellow | olive yellow |
| 349 | 250 | 5Y66 | 5Y | 6 | 6 | olive yellow | olive | dark yellow | olive |

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| | | | | | | | yellow | | |
| 350 | 251 | 5Y68 | 5Y | 6 | 8 | olive yellow | olive yellow | olive yellow | olive |
| 351 | 252 | 5Y71 | 5Y | 7 | 1 | light grey | light grey | greyish yellow | light grey |
| 352 | 253 | 5Y72 | 5Y | 7 | 2 | light grey | light grey | greyish yellow | light grey |
| 353 | 254 | 5Y73 | 5Y | 7 | 3 | pale yellow | pale yellow | greyish yellow | light yellow |
| 354 | 255 | 5Y74 | 5Y | 7 | 4 | pale yellow | pale yellow | dull yellow | light yellow |
| 355 | 256 | 5Y76 | 5Y | 7 | 6 | yellow | yellow | dull yellow | yellow |
| 356 | 257 | 5Y78 | 5Y | 7 | 8 | yellow | yellow | olive yellow | yellow |
| 357 | 258 | 5Y81 | 5Y | 8 | 1 | white | white | greyish yellow | light grey |
| 358 | 259 | 5Y82 | 5Y | 8 | 2 | white | pale yellow | greyish yellow | light grey |
| 359 | 260 | 5Y83 | 5Y | 8 | 3 | pale yellow | pale yellow | greyish yellow | pale yellow |
| 360 | 261 | 5Y84 | 5Y | 8 | 4 | pale yellow | pale yellow | dull yellow | pale yellow |
| 361 | 262 | 5Y86 | 5Y | 8 | 6 | yellow | yellow | dull yellow | yellow |
| 362 | 263 | 5Y88 | 5Y | 8 | 8 | yellow | yellow | strong yellow | yellow |
| 368 | | 5YR251 | 5YR | 2.5 | 1 | | black | | |
| 369 | | 5YR252 | 5YR | 2.5 | 2 | | dark reddish brown | | |
| 370 | 269 | 5YR31 | 5YR | 3 | 1 | very dark grey | very dark grey | dark greyish brown | brownish black |
| 371 | 270 | 5YR32 | 5YR | 3 | 2 | dark reddish brown | dark reddish brown | dark greyish brown | dark reddish brown |
| 372 | 271 | 5YR33 | 5YR | 3 | 3 | dark reddish brown | dark reddish brown | dark greyish brown | dark reddish brown |
| 373 | 272 | 5YR34 | 5YR | 3 | 4 | dark reddish brown | dark reddish brown | brown | dark reddish brown |
| 375 | 274 | 5YR41 | 5YR | 4 | 1 | dark grey | dark grey | greyish brown | brownish grey |
| 376 | 275 | 5YR42 | 5YR | 4 | 2 | dark reddish grey | dark reddish grey | greyish brown | greyish brown |
| 377 | 276 | 5YR43 | 5YR | 4 | 3 | reddish brown | reddish brown | greyish brown | dull reddish brown |

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| 378 | 277 | 5YR44 | 5YR | 4 | 4 | reddish brown | reddish brown | brown | dull reddish brown |
| 379 | 278 | 5YR46 | 5YR | 4 | 6 | yellowish red | yellowish red | brown | reddish brown |
| 381 | 280 | 5YR51 | 5YR | 5 | 1 | grey | grey | greyish brown | brownish grey |
| 382 | 281 | 5YR52 | 5YR | 5 | 2 | reddish grey | reddish grey | greyish brown | greyish brown |
| 383 | 282 | 5YR53 | 5YR | 5 | 3 | reddish brown | reddish brown | greyish brown | dull reddish brown |
| 384 | 283 | 5YR54 | 5YR | 5 | 4 | reddish brown | reddish brown | light brown | dull reddish brown |
| 385 | 284 | 5YR56 | 5YR | 5 | 6 | yellowish red | yellowish red | light brown | bright reddish brown |
| 386 | 285 | 5YR58 | 5YR | 5 | 8 | yellowish red | yellowish red | deep orange | bright reddish brown |
| 387 | 286 | 5YR61 | 5YR | 6 | 1 | grey | grey | pinkish beige | brownish grey |
| 388 | 287 | 5YR62 | 5YR | 6 | 2 | pinkish grey | pinkish grey | pinkish beige | greyish brown |
| 389 | 288 | 5YR63 | 5YR | 6 | 3 | light reddish brown | light reddish brown | pinkish beige | dull orange |
| 390 | 289 | 5YR64 | 5YR | 6 | 4 | light reddish brown | light reddish brown | light brown | dull orange |
| 391 | 290 | 5YR66 | 5YR | 6 | 6 | reddish yellow | reddish yellow | light brown | orange |
| 392 | 291 | 5YR68 | 5YR | 6 | 8 | reddish yellow | reddish yellow | strong orange | orange |
| 393 | 292 | 5YR71 | 5YR | 7 | 1 | light grey | light grey | pinkish beige | light brownish grey |
| 394 | 293 | 5YR72 | 5YR | 7 | 2 | pinkish grey | pinkish grey | pinkish beige | light brownish grey |
| 395 | 294 | 5YR73 | 5YR | 7 | 3 | pink | pink | pinkish beige | dull orange |
| 396 | 295 | 5YR74 | 5YR | 7 | 4 | pink | pink | dull orange | dull orange |
| 397 | 296 | 5YR76 | 5YR | 7 | 6 | reddish yellow | reddish yellow | dull orange | orange |
| 398 | 297 | 5YR78 | 5YR | 7 | 8 | reddish yellow | reddish yellow | light orange | orange |
| 399 | 298 | 5YR81 | 5YR | 8 | 1 | white | white | pale | light grey |

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|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | pinkish beige | |
| 400 | 299 | 5YR82 | 5YR | 8 | 2 | pinkish white | pinkish white | pale pinkish beige | light grey |
| 401 | 300 | 5YR83 | 5YR | 8 | 3 | pink | pink | pale orange | pale orange |
| 402 | 301 | 5YR84 | 5YR | 8 | 4 | pink | pink | pale orange | pale orange |
| 414 | | 75R251 | 75R | 2.5 | 1 | | reddish black | | |
| 415 | | 75R252 | 75R | 2.5 | 2 | | very dusky red | | |
| 416 | | 75R253 | 75R | 2.5 | 3 | | very dusky red | | |
| 417 | | 75R254 | 75R | 2.5 | 4 | | very dusky red | | |
| 418 | 313 | 75R31 | 75R | 3 | 1 | | dark reddish brown | dark greyish brown | dark reddish grey |
| 419 | 314 | 75R32 | 75R | 3 | 2 | | dusky red | dark greyish brown | dark reddish brown |
| 420 | 315 | 75R33 | 75R | 3 | 3 | | dusky red | dark greyish brown | dark reddish brown |
| 421 | 316 | 75R34 | 75R | 3 | 4 | | dusky red | reddish brown | dark red |
| 422 | 317 | 75R36 | 75R | 3 | 6 | | dark red | reddish brown | dark red |
| 423 | | 75R38 | 75R | 3 | 8 | | dark red | | |
| 424 | 318 | 75R41 | 75R | 4 | 1 | | dark reddish grey | greyish brown | dark reddish grey |
| 425 | 319 | 75R42 | 75R | 4 | 2 | | weak red | greyish brown | greyish red |
| 426 | 320 | 75R43 | 75R | 4 | 3 | | weak red | greyish brown | dull reddish brown |
| 427 | 321 | 75R44 | 75R | 4 | 4 | | weak red | reddish brown | dusky red |
| 428 | 322 | 75R46 | 75R | 4 | 6 | | red | reddish brown | red |
| 429 | 323 | 75R48 | 75R | 4 | 8 | | red | reddish brown | red |
| 430 | 324 | 75R51 | 75R | 5 | 1 | | reddish grey | greyish brown | reddish grey |
| 431 | 325 | 75R52 | 75R | 5 | 2 | | weak red | greyish brown | greyish red |
| 432 | 326 | 75R53 | 75R | 5 | 3 | | weak red | greyish | dull |

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| | | | | | | | | brown | reddish brown |
| 433 | | 75R54 | 75R | 5 | 4 | | weak red | | |
| 434 | | 75Y56 | 75R | 5 | 6 | | red | | |
| 435 | | 75R58 | 75R | 5 | 8 | | red | | |
| 436 | 327 | 75R61 | 75R | 6 | 1 | | reddish grey | greyish brown | reddish grey |
| 437 | 328 | 75R62 | 75R | 6 | 2 | | pale red | greyish brown | greyish red |
| 438 | | 75R63 | 75R | 6 | 3 | | pale red | | |
| 439 | | 75R64 | 75R | 6 | 4 | | pale red | | |
| 440 | | 75R66 | 75R | 6 | 6 | | light red | | |
| 441 | | 75R68 | 75R | 6 | 8 | | light red | | |
| 442 | 329 | 75R71 | 75R | 7 | 1 | | pinkish grey | greyish pink | light reddish grey |
| 443 | | 75R72 | 75R | 7 | 2 | | pale red | | |
| 444 | | 75R73 | 75R | 7 | 3 | | pale red | | |
| 445 | | 75R74 | 75R | 7 | 4 | | pale red | | |
| 446 | | 75R76 | 75R | 7 | 6 | | light red | | |
| 447 | | 75R78 | 75R | 7 | 8 | | light red | | |
| 448 | | 75R81 | 75R | 8 | 1 | | white | | |
| 449 | | 75R82 | 75R | 8 | 2 | | light pink | | |
| 450 | | 75R83 | 75R | 8 | 3 | | light pink | | |
| 451 | | 75R84 | 75R | 8 | 4 | | light pink | | |
| 475 | | 75YR251 | 75YR | 2.5 | 1 | | black | | |
| 476 | | 75YR252 | 75YR | 2.5 | 2 | | very dark brown | | |
| 477 | | 75YR253 | 75YR | 2.5 | 3 | | very dark brown | | |
| 478 | 353 | 75YR31 | 75YR | 3 | 1 | | very dark grey | dark greyish brown | brownish black |
| 479 | 354 | 75YR32 | 75YR | 3 | 2 | dark brown | dark brown | dark greyish brown | brownish black |
| 480 | 355 | 75YR33 | 75YR | 3 | 3 | | dark brown | dark yellowish brown | dark brown |
| 481 | 356 | 75YR34 | 75YR | 3 | 4 | | dark brown | dark yellowish brown | dark brown |
| 482 | 357 | 75YR41 | 75YR | 4 | 1 | | dark grey | greyish brown | brownish grey |
| 483 | 358 | 75YR42 | 75YR | 4 | 2 | dark brown | brown | greyish brown | greyish brown |
| 484 | 359 | 75YR43 | 75Y | 4 | 3 | | brown | greyish | brown |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | R | | | | | brown | |
| 485 | 360 | 75YR44 | 75Y R | 4 | 4 | dark brown | brown | yellowish brown | brown |
| 486 | 361 | 75YR46 | 75Y R | 4 | 6 | | strong brown | yellowish brown | brown |
| 487 | 362 | 75YR51 | 75Y R | 5 | 1 | | grey | greyish brown | brownish grey |
| 488 | 363 | 75YR52 | 75Y R | 5 | 2 | brown | brown | greyish brown | greyish brown |
| 489 | 364 | 75YR53 | 75Y R | 5 | 3 | | brown | greyish brown | dull brown |
| 490 | 365 | 75YR54 | 75Y R | 5 | 4 | brown | brown | yellowish brown | dull brown |
| 491 | 366 | 75YR56 | 75Y R | 5 | 6 | strong brown | strong brown | yellowish brown | bright brown |
| 492 | 367 | 75YR58 | 75Y R | 5 | 8 | strong brown | strong brown | deep orange | bright brown |
| 493 | 368 | 75YR61 | 75Y R | 6 | 1 | | grey | beige | brownish grey |
| 494 | 369 | 75YR62 | 75Y R | 6 | 2 | pinkish grey | pinkish grey | beige | greyish brown |
| 495 | 370 | 75YR63 | 75Y R | 6 | 3 | | light brown | beige | dull brown |
| 496 | 371 | 75YR64 | 75Y R | 6 | 4 | light brown | light brown | light yellowish brown | dull orange |
| 497 | 372 | 75YR66 | 75Y R | 6 | 6 | reddish yellow | reddish yellow | light yellowish brown | orange |
| 498 | 373 | 75YR68 | 75Y R | 6 | 8 | reddish yellow | reddish yellow | strong orange | orange |
| 499 | 374 | 75YR71 | 75Y R | 7 | 1 | | light grey | beige | light brownish grey |
| 500 | 375 | 75YR72 | 75Y R | 7 | 2 | pinkish grey | pinkish grey | beige | light brownish grey |
| 501 | 376 | 75YR73 | 75Y R | 7 | 3 | | pink | beige | dull orange |
| 502 | 377 | 75YR74 | 75Y R | 7 | 4 | pink | pink | dull orange | dull orange |
| 503 | 378 | 75YR76 | 75Y R | 7 | 6 | reddish yellow | reddish yellow | dull orange | orange |
| 504 | 379 | 75YR78 | 75Y R | 7 | 8 | reddish yellow | reddish yellow | light orange | yellow orange |
| 505 | 380 | 75YR81 | 75Y R | 8 | 1 | | white | pale beige | light grey |
| 506 | 381 | 75YR82 | 75Y R | 8 | 2 | pinkish white | pinkish white | pale beige | light grey |
| 507 | 382 | 75YR83 | 75Y | 8 | 3 | | pink | pale | light |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | R | | | | | orange | yellow orange |
| 508 | 383 | 75YR84 | 75YR | 8 | 4 | pink | pink | pale orange | light yellow orange |
| 509 | | 75YR851 | 75YR | 8.5 | 1 | | white | | |
| 510 | | 75YR852 | 75YR | 8.5 | 2 | | pinkish white | | |
| 511 | 384 | 75YR86 | 75YR | 8 | 6 | reddish yellow | reddish yellow | pale orange | light yellow orange |
| 513 | | 75YR91 | 75YR | 9 | 1 | | white | | |
| 514 | | 75YR92 | 75YR | 9 | 2 | | pale yellowish pink | | |
| 515 | | 75YR951 | 75YR | 9.5 | 1 | | white | | |
| 516 | | 75YR952 | 75YR | 9.5 | 2 | | pale yellowish pink | | |
| 518 | | N250 | N | 2.5 | 0 | | black | | |
| 519 | 387 | N30 | N | 3 | 0 | very dark grey | very dark grey | dark grey | black |
| 520 | 388 | N40 | N | 4 | 0 | dark grey | dark grey | dark medium grey | dark grey |
| 521 | 389 | N50 | N | 5 | 0 | grey | grey | medium grey | grey |
| 522 | 390 | N60 | N | 6 | 0 | grey | grey | light medium grey | grey |
| 523 | 391 | N70 | N | 7 | 0 | light grey | light grey | light grey | greyish white |
| 524 | 392 | N80 | N | 8 | 0 | white | white | light grey | greyish white |
| 525 | | N850 | N | 8.5 | 0 | | white | | |
| 526 | | N90 | N | 9 | 0 | | white | | |
| 527 | | N950 | N | 9.5 | 0 | | white | | |
| 528 | | 10BG251 | | | | | | | |
| 529 | | 10BG31 | | | | | | | |
| 530 | | 10BG41 | | | | | | | |
| 531 | | 10BG51 | | | | | | | |
| 532 | | 10BG81 | | | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 533 | | 10G81 | | | | | | | |

### *Table S_PackingDensity*

| IndexCol | PackingDensCode | PackingDensText | PackingDensPC | PackingDens |
|---|---|---|---|---|
| 1 | VL | Very Low | < 1.20 t m-3 | VL < 1.20 t m-3 |
| 2 | L | Low | 1.20 - 1.40 t m-3 | L 1.20 - 1.40 t m-3 |
| 3 | M | Medium | 1.40 - 1.60 t m-3 | M 1.40 - 1.60 t m-3 |
| 4 | H | High | 1.60 - 1.75 t m-3 | H 1.60 - 1.75 t m-3 |
| 5 | VH | Very High | > 1.75 t m-3 | VH > 1.75 t m-3 |

### *Table S_PeatTypes*

| PeatTypeCode | PeatTypeText |
|---|---|
| C | Carex |
| E | Eriphorum |
| G | Grass |
| H | Hypnum |
| L | Ling |
| M | Molina |
| P | Polytrichum |
| R | Reeds |
| S | Sphagnum |
| W | Woody |

### *Table S_PH*

| PHCode | PHText |
|---|---|
| P | Field measurement with pH probe |
| I | Field measurement with indicator solution |
| L | Laboratory measurement of field sample |

### *Table S_Plasticity*

| IndexCol | PlasticityCode | PlasticityText | PlasticityDesc |
|---|---|---|---|
| 1 | NPL | Non-plastic | No wire is formable |
| 2 | SPL | Slightly plastic | Wire formable but breaks immediately if bent into a ring; deformation by slight force |
| 3 | PL | Plastic | Wire formable but breaks if bent into a ring; deformation by slight to moderate force |
| 4 | VPL | Very plastic | Wire formable and can be bent into a ring; deformation by moderately strong to strong force |

### *Table S_Porosity*

| IndexCol | PorosityCode | PorosityText | PorosityPC | Porosity |
|---|---|---|---|---|
| 1 | VL | Very Low | < 2% | VL < 2% |
| 2 | L | Low | 2-5% | L 2-5% |
| 3 | M | Medium | 5-15% | M 5-15% |
| 4 | H | High | 15-40% | H 15-40% |
| 5 | VH | Very High | > 40% | VH >40% |

### *Table S_PscPeat1*

| IndexCol | PSCPeat1Code | PSCPeat1Text |
|---|---|---|
| 1 | VF | Very fine |
| 2 | F | Fine |
| 3 | M | Medium |
| 4 | C | Coarse |
| 5 | FB | Fibrous peat |
| 6 | SF | Semi-fibrous peat |
| 7 | AM | Amorphous |

### *Table S_PSCPeat2*

| PScPeat2Code | PScPeat2Text |
|---|---|
| C | Clay |
| CL | Clay loam |
| KC | Carbonatic-clayey |
| KL | Carbonatic-loamy |
| KS | Carbonatic-sandy |
| L | Loam |
| LP | Loamy peat |
| LS | Loamy sand |
| P | Peat |
| PL | Peaty loam |
| PS | Peaty sand |
| S | Sand |
| SC | Sandy clay |
| SCL | Sandy clay loam |
| SL | Sandy loam |
| SP | Sandy peat |
| Z | Silt |
| ZC | Silty clay |
| ZCL | Silty clay loam |
| ZL | Silt loam |

### *Table S_PSMOD*

| PSMODCode | PSMODText |
|---|---|
| CEY | Clayey |
| CLY | Coarse loamy |
| CZY | Coarse silty |
| FLY | Fine loamy |
| FZY | Fine silty |
| K | Carbonatic |
| LY | Loamy |
| SY | Sandy |

### *Table S_RockStone*

| IndexCol | OutcropCode | OutCropPC | OutCropText | OutCrop |
|---|---|---|---|---|
| 1 | N | 0 % | None | N 0 % |
| 2 | V | 0-2 % | Very few | V 0-2 % |
| 3 | F | 2-5 % | Few | F 2-5 % |
| 4 | C | 5-15 % | Common | C 5-15 % |
| 5 | M | 15-40 % | Many | M 15-40 % |
| 6 | A | 40-80 % | Abundant | A 40-80 % |
| 7 | D | > 80 % | Dominant | D > 80 % |

### *Table S_RootAbund*

| IndexCol | RootSizeCode | RootAbCode | RootABText | RootAbNumPer100 | RootAbund | SizeAbund |
|---|---|---|---|---|---|---|
| 1 | C | N | None | 0 | N 0 | CN |
| 1 | F | N | None | 0 | N 0 | FN |
| 1 | M | N | None | 0 | N 0 | MN |
| 1 | VF | N | None | 0 | N 0 | VFN |
| 2 | C | V | Very few | 1-2 | V 1-2 | CV |
| 2 | F | V | Very few | 1-20 | V 1-20 | FV |
| 2 | M | V | Very few | 1-2 | V 1-2 | MV |
| 2 | VF | V | Very few | 1-20 | V 1-20 | VFV |
| 3 | C | F | Few | 2-5 | F 2-5 | CF |
| 3 | F | F | Few | 20-50 | F 20-50 | FF |
| 3 | M | F | Few | 2-5 | F 2-5 | MF |
| 3 | VF | F | Few | 20-50 | F 20-50 | VFF |
| 4 | C | C | Common | 5-20 | C 5-20 | CC |
| 4 | F | C | Common | 50-200 | C 50-200 | FC |
| 4 | M | C | Common | 5-20 | C 5-20 | MC |
| 4 | VF | C | Common | 50-200 | C 50-200 | VFC |
| 5 | C | M | Many | > 20 | M > 20 | CM |
| 5 | F | M | Many | > 200 | M > 200 | FM |
| 5 | M | M | Many | > 20 | M > 20 | MM |

| | | | | | | |
|---|---|---|---|---|---|---|
| 5 | VF | M | Many | > 200 | M > 200 | VFM |

### *Table S_RootSize*

| RootSizeCode | RootSizeDesc | RootSizeText | RootSize |
|---|---|---|---|
| VF | Very fine | < 0.5 mm | VF < 0.5 mm |
| F | Fine | 0.5-2 mm | F 0.5-2 mm |
| M | Medium | 2-5 mm | M 2-5 mm |
| C | Coarse | > 5 mm | C > 5 mm |

### *Table S_series*

| SERIES_NAM | SUBGROUP | SERIES | Series_Defn | SERIES_SYM |
|---|---|---|---|---|
| Aherlow | 811 | AH | Sandy river alluvium | 811AH |
| Ahuan | 621 | AH | Loamy drift with siliceous stones | 621AH |
| Aille | 311 | AL | Coarse loamy over limestone bedrock | 311AL |
| Allen | 911 | AE | Peat (Raised Bog {moss}) | 911AE |
| Ardmore | 1011 | AR | Coarse loamy drift with siliceous stones | 1011AR |
| Ashgrove | 313 | AS | Fine loamy drift with siliceous stones | 313AS |
| Athy | 411 | AT | Coarse loamy over calcareous gravels | 411AT |
| Aughty | 911 | AT | Peat (Blanket Bog) | 911AT |
| Aughty cutover | 913 | ATC | Peat (Blanket Bog) | 913ATC |
| Baggotstown | 321 | BG | Coarse loamy over calcareous gravels | 321BG |
| Ballinamoor | 712 | BN | Fine loamy drift with limestones | 712BN |
| Ballincurra | 321 | BC | Fine loamy over limestone bedrock | 321BC |
| Ballintemple | 724 | BT | Coarse loamy drift with limestones | 724BT |
| Ballycondon | 611 | BN | Loamy drift with siliceous stones | 611BN |
| Ballyglass | 311 | BG | Coarse loamy over sandstone bedrock | 311BG |
| Ballyhaise lithic phase | 712 | BL | Fine loamy over sandstone or shale bedrock | 712BL |
| Ballyknockan | 722 | BK | Sandy stoneless drift | 722BK |
| Ballylanders | 311 | BY | Fine loamy over shale or slate bedrock | 311BY |
| Ballynamona | 411 | BY | Fine loamy drift with igneous and metamorphic stones | 411BY |
| Ballyscanlon | 611 | BS | Loamy over acid igneous rock | 611BS |
| Ballyshear | 724 | BS | Fine loamy drift with limestones | 724BS |
| Ballyvorheen | 311 | BV | Sandy drift with siliceous stones | 311BV |
| Ballywilliam | 722 | BW | Coarse loamy drift with igneous and metamorphic stones | 722BW |
| Banagher | 922 | BR | Peat (Fen) | 922BR |
| Bantry | 113 | BA | Peat over sandstone and shale bedrock | 113BA |
| Bantry Bay | 313 | BB | Coarse loamy dense blue-grey drift with siliceous stones | 313BB |
| Belmullet | 721 | BM | Sandy stoneless drift | 721BM |
| Black Rock Mountain | 611 | BR | Loamy over gneiss and schist bedrock | 611BR |

| | | | | |
|---|---|---|---|---|
| Blackstairs | 632 | BL | Sandy over granite bedrock | 632BL |
| Borris | 311 | BO | Coarse loamy drift with igneous and metamorphic stones | 311BO |
| Borrisoleigh | 513 | BE | Fine loamy over mudstone, shale or slate | 513BE |
| Boyne | 821 | BO | Silty river alluvium | 821BO |
| Broadway | 312 | BY | Coarse loamy drift with siliceous stones | 312BY |
| Broomhill | 311 | BL | Fine loamy over sandstone bedrock | 311BL |
| Broughillstown | 311 | BR | Coarse loamy over calcareous gravels | 311BR |
| Burren | 213 | BU | Fine loamy over limestone bedrock | 213BU |
| Camoge | 822 | CA | Clayey river alluvium | 822CA |
| Carne | 511 | CA | Coarse loamy stoneless drift | 511CA |
| Carney | 212 | CY | Carbonatic-clayey lake marl | 212CY |
| Carrickbyrne | 612 | CB | Loamy over acid and basic igneous bedrock | 612CB |
| Carrigogunnel | 313 | CG | Coarse loamy over lithoskeletal basic igneous rock | 313CG |
| Carrigvahanagh | 113 | CV | Peat over lithoskeletal acid igneous rock | 113CV |
| Clashmore | 311 | CM | Coarse loamy drift with siliceous stones | 311CM |
| Clohamon | 811 | CN | Coarse loamy river alluvium | 811CN |
| Clohernagh | 711 | CH | Fine loamy fragic drift with siliceous stones | 711CH |
| Clonaslee | 723 | CS | Coarse loamy over calcareous gravels | 723CS |
| Clonegall | 512 | CG | Coarse loamy drift with siliceous stones | 512CG |
| Clonin | 511 | CN | Coarse loamy over sandstone bedrock | 511CN |
| Clonroche | 311 | CL | Fine loamy drift with siliceous stones | 311CL |
| Clonsast | 914 | CS | Peat (Raised Bog, Industrial milled and machined) | 914CS |
| Cluggin | 712 | CG | Clayey drift with siliceous stones | 712CG |
| Cooga | 511 | C0 | Coarse loamy drift with siliceous stones | 511C0 |
| Coolalough | 822 | CL | Clayey lake alluvium | 822CL |
| Coolanick | 824 | CN | Silty lake alluvium | 824CN |
| Coolfin | 822 | CF | Fine silty river alluvium | 822CF |
| Corriga | 514 | CR | Fine loamy drift with siliceous stones | 514CR |
| Crossabeg | 412 | CB | Fine loamy drift with siliceous stones | 412CB |
| Crossmolina | 513 | CM | Coarse loamy drift with limestones | 513CM |
| Crosstown | 414 | CO | Coarse loamy drift with siliceous stones | 414CO |
| Crush | 213 | CS | Coarse loamy over calcareous gravels | 213CS |
| Cullahill | 321 | CH | Fine loamy drift with limestones | 321CH |
| Cupidstownhill | 511 | CU | Fine loamy over shale bedrock | 511CU |
| Curragh | 1011 | CU | Coarse loamy stoneless drift (calcareous sand) | 1011CU |
| Dooyork | 311 | DY | Sandy stoneless drift | 311DY |
| Dovea | 311 | DO | Fine silty drift with limestones | 311DO |
| Driminidy | 712 | DY | Coarse loamy drift with siliceous stones | 712DY |
| Drombanny | 824 | DR | Carbonatic-loamy lake marl | 824DR |

| | | | | |
|---|---|---|---|---|
| Drumkeeran | 711 | DK | Clayey drift with siliceous stones | 711DK |
| Drumsleed | 632 | DS | Sandy drift with siliceous stones | 632DS |
| Drumslig | 611 | DS | Loamy over sandstone bedrock | 611DS |
| Dunboyne | 411 | DB | Fine loamy drift with siliceous stones | 411DB |
| Dungarvan | 411 | DG | Coarse loamy drift with siliceous stones | 411DG |
| Dunsany | 823 | DU | Carbonatic-clayey lake marl | 823DU |
| Elton | 411 | ET | Fine loamy drift with limestones | 411ET |
| Feale | 821 | FA | Fine loamy river alluvium | 821FA |
| Fethard | 414 | FE | Fine loamy drift with siliceous stones | 414FE |
| Finisk | 811 | FI | Fine silty over non-calcareous gravels | 811FI |
| Forth Commons | 632 | FC | Loamy over sandstone bedrock | 632FC |
| Garrynamona | 912 | GN | Peat (raised bog) | 912GN |
| Glenary | 632 | BL | Loamy drift with siliceous stones | 632BL |
| Gortaclareen | 712 | GN | Fine loamy drift with siliceous stones | 712GN |
| Gortnamona | 913 | GM | Peat (Raised Bog) | 913GM |
| Greename | 731 | GE | Loamy drift with siliceous stones | 731GE |
| Griston | 822 | GR | Sandy lake alluvium | 822GR |
| Howardstown | 712 | HN | Clayey limestone drift | 712HN |
| Ilen | 811 | IL | Loamy river alluvium over gravels | 811IL |
| Johnstown | 412 | JH | Coarse loamy drift with siliceous stones | 412JH |
| Kellistown | 411 | KL | Coarse loamy drift with igneous and metamorphic stones | 411KL |
| Kells | 311 | KE | Coarse loamy over hard shale bedrock | 311KE |
| Kennycourt | 311 | KC | Fine loamy drift with limestones | 311KC |
| Kilbarry | 921 | KR | Peat over river alluvium | 921KR |
| Kilcolgan | 213 | KC | Fine loamy drift with limestones | 213KC |
| Kilfenora | 321 | KF | Clayey drift over limestone bedrock | 321KF |
| Kilgory | 821 | KG | Sandy river alluvium | 821KG |
| Kill | 311 | KI | Fine loamy drift with igneous and metamorphic stones | 311KI |
| Kill lithic phase | 311 | KIL | Fine loamy over acid igneous bedrock | 311KIL |
| Killadoon | 631 | KD | Loamy drift with siliceous stones | 631KD |
| Killinga | 632 | KA | Loamy drift with siliceous stones | 632KA |
| Kilmannock | 821 | KK | Silty estuarine alluvium | 821KK |
| Kilmore Slob | 823 | KS | Sandy marine alluvium | 823KS |
| Kilmore slob variant | 823 | KSV | Clayey marine alluvium | 823KSV |
| Kilpierce | 721 | KP | Fine loamy drift with siliceous stones | 721KP |
| Kilrush | 711 | KR | Fine loamy drift with siliceous stones | 711KR |
| Kiltealy | 511 | KY | Sandy drift with igneous and metamorphic stones | 511KY |
| Kinvarra | 311 | KV | Fine loamy over clayey drift with limestones | 311KV |
| Knockaceol | 513 | KC | Coarse loamy over sandstone bedrock | 513KC |
| Knockastanna | 632 | KS | Loamy over shale bedrock | 632KS |

| | | | | |
|---|---|---|---|---|
| Knockboy | 513 | KB | Coarse loamy drift with siliceous stones | 513KB |
| Knockeyon | 112 | KY | Loamy over lithoskeletal sandstone | 112KY |
| Knockmealdown | 911 | KM | Peat over rock | 911KM |
| Knockroe | 721 | KO | Coarse loamy drift with siliceous stones | 721KO |
| Knockshigowna | 112 | KW | Loamy over lithoskeletal shale or slate bedrock | 112KW |
| Knocksquire | 311 | KN | Coarse loamy over acid igneous bedrock | 311KN |
| Ladestown | 311 | LA | Fine loamy over calcareous gravels | 311LA |
| Loughmuirran | 314 | LO | Clayey drift with siliceous stones (colluvium) | 314LO |
| Lyre | 821 | LY | Coarse loamy river alluvium | 821LY |
| Macamore | 711 | MC | Fine loamy over clayey drift with limestones | 711MC |
| Millquarter | 822 | MQ | Fine silty lake alluvium | 822MQ |
| Milltownpass | 813 | MP | Sandy stoneless drift | 813MP |
| Monatray | 1011 | MT | Loamy drift with siliceous stones | 1011MT |
| Monavullagh | 632 | MV | Sandy over sandstone bedrock (conglomerate) | 632MV |
| Moord | 314 | MO | Fine loamy drift with siliceous stones | 314MO |
| Mortarstown | 411 | MT | Fine loamy over clayey drift with limestones | 411MT |
| Mylerstown | 723 | MT | Fine loamy drift with limestones | 723MT |
| Newport | 711 | NW | Coarse loamy drift with limestones | 711NW |
| Newtown | 722 | NT | Coarse loamy drift with igneous and metamorphic stones | 722NT |
| Not classified | 999 | ZZ | Not defined | 999ZZ |
| Patrickswell | 411 | PW | Loamy drift with limestones | 411PW |
| Patrickswell lithic phase | 411 | PWL | Fine loamy over limestone bedrock | 411PWL |
| Pollardstown | 921 | PT | Peat (Fen, undrained) | 921PT |
| Portlaw | 612 | PO | Loamy drift with siliceous stones | 612PO |
| Puckane | 722 | PU | Coarse loamy drift with siliceous stones | 722PU |
| Randallsmill | 311 | RM | Coarse loamy stoneless drift | 311RM |
| Rathkenny | 513 | RK | Fine loamy drift with siliceous stones | 513RK |
| Rathowen | 414 | RA | Fine loamy drift with limestones | 414RA |
| Rearymore | 812 | RY | Fine loamy river alluvium | 812RY |
| Rineanna | 112 | RN | Loamy over lithoskeletal limestone | 112RN |
| Ross Carbery | 511 | RO | Coarse loamy compact drift with siliceous stones | 511RO |
| Schull | 313 | SH | Coarse loamy drift with siliceous stones | 313SH |
| Schull Plaggen | 1011 | SHP | Coarse loamy drift with siliceous stones | 1011SHP |
| Screen | 511 | SN | Sandy stoneless drift | 511SN |
| Seafield | 211 | SE | Sandy stoneless drift | 211SE |
| Shannon | 822 | SH | Fine silty estuarine alluvium | 822SH |
| Slieve Bloom | 722 | SB | Coarse loamy drift with siliceous stones | 722SB |
| Slievebeag | 611 | SG | Loamy over shale bedrock | 611SG |

| | | | | |
|---|---|---|---|---|
| Stonepark | 611 | SP | Loamy drift with igneous and metamorphic stones | 611SP |
| Straffan | 711 | ST | Fine loamy drift with limestones | 711ST |
| Suir | 811 | SU | Fine silty river alluvium | 811SU |
| Tomard | 512 | TO | Fine loamy over shale or slate bedrock | 512TO |
| Tourmakeady | 722 | TK | Fine loamy drift with siliceous stones | 722TK |
| Tramore | 711 | TR | Coarse loamy drift with igneous and metamorphic stones | 711TR |
| Turbary | 913 | TB | Peat (Raised Bog, undrained, hand-cut) | 913TB |
| UNnamed_01 | 111 | UN01 | Loamy over lithoskeletal basic igneous rock | 111UN01 |
| UNnamed_02 | 112 | UN02 | Loamy over lithoskeletal gneiss or schist | 112UN02 |
| UNnamed_03 | 311 | UN03 | Fine loamy over non-calcareous gravels | 311UN03 |
| UNnamed_04 | 313 | UN04 | Fine loamy over shale bedrock | 313UN04 |
| UNnamed_05 | 321 | UN05 | Fine loamy over calcareous gravels | 321UN05 |
| UNnamed_06 | 511 | UN06 | Coarse loamy over non-calcareous gravels | 511UN06 |
| UNnamed_08 | 711 | UN08 | Clayey over soft shale/slate bedrock | 711UN08 |
| UNnamed_09 | 711 | UN09 | Fine loamy over clayey drift with siliceous stones | 711UN09 |
| UNnamed_10 | 721 | UN10 | Loamy over lithoskeletal shale or slate bedrock | 721UN10 |
| UNnamed_11 | 811 | UN11 | Coarse loamy river alluvium | 811UN11 |
| UNnamed_12 | 811 | UN12 | Silty river alluvium | 811UN12 |
| UNnamed_13 | 812 | UN13 | Silty river alluvium | 812UN13 |
| UNnamed_14 | 111 | UN14 | Loamy over shale bedrock | 111UN14 |
| UNnamed_15 | 211 | UN15 | Loamy over limestone bedrock | 211UN15 |
| UNnamed_16 | 312 | UN16 | Fine loamy drift with siliceous stones | 312UN16 |
| UNnamed_18 | 314 | UN18 | Fine loamy over sandstone bedrock | 314UN18 |
| UNnamed_19 | 314 | UN19 | Fine loamy over shale bedrock | 314UN19 |
| UNnamed_20 | 321 | UN20 | Fine loamy drift with limestones | 321UN20 |
| UNnamed_22 | 411 | UN22 | Fine loamy over sandstone bedrock | 411UN22 |
| UNnamed_23 | 411 | UN23 | Fine loamy over shale bedrock | 411UN23 |
| UNnamed_24 | 411 | UN24 | Fine loamy over clayey drift with siliceous stones | 411UN24 |
| UNnamed_25 | 412 | UN25 | Fine loamy drift with limestones | 412UN25 |
| UNnamed_26 | 412 | UN26 | Fine loamy drift with siliceous stones | 412UN26 |
| UNnamed_27 | 414 | UN27 | Fine loamy over shale bedrock | 414UN27 |
| UNnamed_28 | 414 | UN28 | Fine loamy over clayey drift with siliceous stones | 414UN28 |
| UNnamed_29 | 511 | UN29 | Fine loamy drift with siliceous stones | 511UN29 |
| UNnamed_30 | 511 | UN30 | Fine loamy over shale bedrock | 511UN30 |
| UNnamed_31 | 511 | UN31 | Fine loamy over sandstone bedrock | 511UN31 |
| UNnamed_32 | 513 | UN32 | Fine loamy over sandstone bedrock | 513UN32 |
| UNnamed_33 | 514 | UN33 | Coarse loamy over sandstone bedrock | 514UN33 |
| UNnamed_36 | 631 | UN36 | Loamy over sandstone bedrock | 631UN36 |

| | | | | |
|---|---|---|---|---|
| UNnamed_37 | 631 | UN37 | Sandy drift with siliceous stones | 631UN37 |
| UNnamed_38 | 612 | UN38 | Sandy drift with siliceous stones | 612UN38 |
| UNnamed_39 | 711 | UN39 | Clayey Stoneless drift | 711UN39 |
| UNnamed_40 | 711 | UN40 | Fine loamy over shale bedrock | 711UN40 |
| UNnamed_41 | 711 | UN41 | Fine silty shale bedrock | 711UN41 |
| UNnamed_42 | 721 | UN42 | Fine loamy drift with limestones | 721UN42 |
| UNnamed_43 | 721 | UN43 | Fine loamy stoneless drift | 721UN43 |
| UNnamed_45 | 723 | UN45 | Coarse loamy drift with limestones | 723UN45 |
| UNnamed_46 | 723 | UN46 | Fine loamy over calcareous gravels | 723UN46 |
| UNnamed_47 | 731 | UN47 | Fine loamy drift with siliceous stones | 731UN47 |
| UNnamed_48 | 821 | UN48 | Fine loamy lake alluvium | 821UN48 |
| UNnamed_49 | 822 | UN49 | Coarse loamy river alluvium | 822UN49 |
| UNnamed_50 | 822 | UN50 | Coarse loamy over calcareous gravels | 822UN50 |
| UNnamed_51 | 111 | UN51 | Loamy over sandstone bedrock | 111UN51 |
| UNnamed_52 | 314 | UN52 | Coarse loamy drift with limestones | 314UN52 |
| UNnamed_53 | 314 | UN53 | Coarse loamy drift with siliceous stones | 314UN53 |
| UNnamed_54 | 323 | UN54 | Fine loamy drift with limestones | 323UN54 |
| UNnamed_56 | 414 | UN56 | Fine loamy over clayey drift with limestones | 414UN56 |
| UNnamed_57 | 414 | UN57 | Fine silty drift with siliceous stones | 414UN57 |
| UNnamed_58 | 612 | UN58 | Loamy over sandstone bedrock | 612UN58 |
| UNnamed_59 | 711 | UN59 | Fine loamy over clayey over shale bedrock | 711UN59 |
| UNnamed_60 | 711 | UN60 | Fine silty drift with siliceous stones | 711UN60 |
| UNnamed_61 | 722 | UN61 | Fine silty drift with siliceous stones | 722UN61 |
| UNnamed_62 | 812 | UN62 | Carbonatic-loamy lake alluvium | 812UN62 |
| UNnamed_63 | 821 | UN63 | Fine silty lake alluvium | 821UN63 |
| UNnamed_65 | 311 | UN65 | Coarse loamy over limestone bedrock | 311UN65 |
| Vicarstown | 821 | VI | Clayey river alluvium | 821VI |
| Wexford slob | 822 | WS | Silty marine alluvium | 822WS |
| Wonderhill | 313 | WO | Fine loamy over lithoskeletal basic igneous rock | 313WO |

### *Table S_Slope*

| slope | SlopeText |
|---|---|
| < 3 | Level to gently sloping |
| 3 - 7 | Moderately sloping |
| 8 - 11 | Strongly sloping |
| 12 - 15 | Moderately steeply sloping |
| 16 - 25 | Steeply sloping |
| > 25 | Very steeply sloping to precipitous |

### *Table S_SlopeAspect*

| SlopeAspectCode |
|---|
| E |
| ENE |
| ESE |
| N |
| NE |
| NNE |
| NNW |
| none |
| NW |
| S |
| SE |
| SSE |
| SSW |
| SW |
| W |
| WNW |
| WSW |

### *Table S_SlopeShape*

| SlopeShape | ShapeText |
|---|---|
| S | Straight |
| C | Concave |
| V | Convex |
| X | Complex |
| T | Terraced |

### *Table S_SoilWater*

| IndexCol | SoilWaterCode | SoilWaterText |
|---|---|---|
| 1 | VD | Very dry |
| 2 | D | Dry |
| 3 | SM | Slightly moist |
| 4 | M | Moist |
| 5 | W | Wet |
| 6 | VW | Very wet |

### *Table S_Status*

| StatusCode | StatusText |
|---|---|
| A | Auger |
| C | Cutting |
| E | Exhibition |

| | |
|---|---|
| M | Mini pit |
| P | ProfilePit |

### *Table S_Stickiness*

| IndexCol | StickinessCode | StickinessText | StickinessDesc |
|---|---|---|---|
| 1 | NST | Non-sticky | No soil material adheres to thumb and finger after release of pressure |
| 2 | SST | Slightly sticky | Soil material adheres to thumb and finger after release of pressure, but it is easily removed. |
| 3 | ST | Sticky | Soil material adheres to thumb and finger after release of pressure, and tends to stretch and pull apart rather than coming away from each digit |
| 4 | VST | Very sticky | Soil material adheres strongly to thumb and finger after release of pressure, and stretches when fingers are separated |

### *Table S_StoneAbundance*

| IndexCol | StoneAbCode | StoneAbPC | StoneABText | StoneAbund |
|---|---|---|---|---|
| 1 | N | 0 % | None | N 0 % |
| 2 | VF | 0-2 % | Very few | VF 0-2 % |
| 3 | F | 2-5 % | Few | F 2-5 % |
| 4 | C | 5-15 % | Common | C 5-15 % |
| 5 | M | 15-40 % | Many | M 15-40 % |
| 6 | A | 40-80 % | Abundant | A 40-80 % |
| 7 | D | > 80 % | Dominant | D > 80 % |

### *Table S_StoneShape*

| StoneShapeCode | StoneShapeText |
|---|---|
| PL | Flat/platy |
| AN | Angular |
| SA | Sub angular |
| SR | Sub rounded |
| RO | Rounded |

### *Table S_StoneSize*

| IndexCol | StoneSizeCode | StoneSizedesc | StoneSizeText | StoneSize |
|---|---|---|---|---|
| 1 | F | Fine gravels | 2-6 mm | F 2-6 mm |
| 2 | M | Medium gravels | 6mm -2 cm | M 6mm - 2cm |
| 3 | C | Coarse gravels | 2-6 cm | C 2-6 cm |
| 4 | S | Stones | 6-20 cm | S 6-20 cm |
| 5 | B | Boulders | 20-60 cm | B 20-60 cm |
| 6 | LB | Large boulders | > 60 cm | LB > 60 cm |

### *Table S_stonetype*

| StoneTypeCode | StoneTypeText |
|---|---|
| BA | Basalt |
| CH | Chert |
| GA | Gabbro |
| GN | Gneiss |
| GR | Granite |
| IGM | Igneous and metamorphic |
| LIM | Limestone |
| MG | Millstone grit |
| ORS | Old Red sandstone |
| QZ | Quartzite |
| RH | Rhyolite |
| SAN | Sandstone |
| SCH | Schist |
| SH | Shale |
| SIL | Siliceous stones |
| SL | Slate |

### *Table S_StructureGrade*

| IndexCol | StructureGradeCode | StructureGradeText |
|---|---|---|
| 1 | WE | Weak |
| 2 | MO | Moderate |
| 3 | ST | Strong |

### *Table S_StructureSize*

| IndexCol | StructureTypeCode | StructureSizeCode | StructureSizeText | StructureSizePC | StructureSize | TypeSize |
|---|---|---|---|---|---|---|
| 1 | AB | VF | Very fine | < 5mm | VF < 5mm | ABVF |
| 1 | ABGR | VF | Very fine | < 5mm | VF < 5mm | ABGRVF |
| 1 | GR | VF | Very fine | < 1mm | VF < 1mm | GRVF |
| 1 | GRSG | VF | Very fine | < 1mm | VF < 1mm | GRSGVF |
| 1 | PL | VF | Very fine | < 1mm | VF < 1mm | PLVF |
| 1 | PLAB | VF | Very fine | < 1mm | VF < 1mm | PLABVF |
| 1 | PLSB | VF | Very fine | < 1mm | VF < 1mm | PLSBVF |
| 1 | PR | VF | Very fine | < 10mm | VF < 10mm | PRVF |
| 1 | PRAB | VF | Very fine | < 10mm | VF < 10mm | PRABVF |
| 1 | PRSB | VF | Very fine | < 10mm | VF < 10mm | PRSBVF |
| 1 | SB | VF | Very fine | < 5mm | VF < 5mm | SBVF |
| 1 | SBGR | VF | Very fine | < 5mm | VF < 5mm | SBGRVF |
| 2 | AB | FF | Very fine to | < 10mm | FF < 10mm | ABFF |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | fine | | | |
| 2 | ABGR | FF | Very fine to fine | < 10mm | FF < 10mm | ABGRFF |
| 2 | GR | FF | Very fine to fine | < 2mm | FF < 2mm | GRFF |
| 2 | GRSG | FF | Very fine to fine | < 2mm | FF < 2mm | GRSGFF |
| 2 | PL | FF | Very fine to fine | < 2mm | FF < 2mm | PLFF |
| 2 | PLAB | FF | Very fine to fine | < 2mm | FF < 2mm | PLABFF |
| 2 | PLSB | FF | Very fine to fine | < 2mm | FF < 2mm | PLSBFF |
| 2 | PR | FF | Very fine to fine | < 20mm | FF < 20mm | PRFF |
| 2 | PRAB | FF | Very fine to fine | < 20mm | FF < 20mm | PRABFF |
| 2 | PRSB | FF | Very fine to fine | < 20mm | FF < 20mm | PRSBFF |
| 2 | SB | FF | Very fine to fine | < 10mm | FF < 10mm | SBFF |
| 2 | SBGR | FF | Very fine to fine | < 10mm | FF < 10mm | SBGRFF |
| 3 | AB | FI | Fine | 5-10mm | FI 5-10mm | ABFI |
| 3 | ABGR | FI | Fine | 5-10mm | FI 5-10mm | ABGRFI |
| 3 | GR | FI | Fine | 1-2mm | FI 1-2mm | GRFI |
| 3 | GRSG | FI | Fine | 1-2mm | FI 1-2mm | GRSGFI |
| 3 | PL | FI | Fine | 1-2mm | FI 1-2mm | PLFI |
| 3 | PLAB | FI | Fine | 1-2mm | FI 1-2mm | PLABFI |
| 3 | PLSB | FI | Fine | 1-2mm | FI 1-2mm | PLSBFI |
| 3 | PR | FI | Fine | 10-20mm | FI 10-20mm | PRFI |
| 3 | PRAB | FI | Fine | 10-20mm | FI 10-20mm | PRABFI |
| 3 | PRSB | FI | Fine | 10-20mm | FI 10-20mm | PRSBFI |
| 3 | SB | FI | Fine | 5-10mm | FI 5-10mm | SBFI |
| 3 | SBGR | FI | Fine | 5-10mm | FI 5-10mm | SBGRFI |
| 4 | AB | VM | Very fine to medium | < 20mm | VM < 20mm | ABVM |
| 4 | ABGR | VM | Very fine to medium | < 20mm | VM < 20mm | ABGRVM |
| 4 | GR | VM | Very fine to medium | < 5mm | VM < 5mm | GRVM |
| 4 | GRSG | VM | Very fine to medium | < 5mm | VM < 5mm | GRSGVM |
| 4 | PL | VM | Very fine to medium | < 5mm | VM < 5mm | PLVM |
| 4 | PLAB | VM | Very fine to medium | < 5mm | VM < 5mm | PLABVM |
| 4 | PLSB | VM | Very fine to | < 5mm | VM < 5mm | PLSBVM |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | medium | | | |
| 4 | PR | VM | Very fine to medium | < 50mm | VM < 50mm | PRVM |
| 4 | PRAB | VM | Very fine to medium | < 50mm | VM < 50mm | PRABVM |
| 4 | PRSB | VM | Very fine to medium | < 50mm | VM < 50mm | PRSBVM |
| 4 | SB | VM | Very fine to medium | < 20mm | VM < 20mm | SBVM |
| 4 | SBGR | VM | Very fine to medium | < 20mm | VM < 20mm | SBGRVM |
| 5 | AB | FM | Fine to medium | 5-20mm | FM 5-20mm | ABFM |
| 5 | ABGR | FM | Fine to medium | 5-20mm | FM 5-20mm | ABGRFM |
| 5 | GR | FM | Fine to medium | 1-5mm | FM 1-5mm | GRFM |
| 5 | GRSG | FM | Fine to medium | 1-5mm | FM 1-5mm | GRSGFM |
| 5 | PL | FM | Fine to medium | 1-5mm | FM 1-5mm | PLFM |
| 5 | PLAB | FM | Fine to medium | 1-5mm | FM 1-5mm | PLABFM |
| 5 | PLSB | FM | Fine to medium | 1-5mm | FM 1-5mm | PLSBFM |
| 5 | PR | FM | Fine to medium | 10-50mm | FM 10-50mm | PRFM |
| 5 | PRAB | FM | Fine to medium | 10-50mm | FM 10-50mm | PRABFM |
| 5 | PRSB | FM | Fine to medium | 10-50mm | FM 10-50mm | PRSBFM |
| 5 | SB | FM | Fine to medium | 5-20mm | FM 5-20mm | SBFM |
| 5 | SBGR | FM | Fine to medium | 5-20mm | FM 5-20mm | SBGRFM |
| 6 | AB | ME | Medium | 10-20mm | ME 10-20mm | ABME |
| 6 | ABGR | ME | Medium | 10-20mm | ME 10-20mm | ABGRME |
| 6 | GR | ME | Medium | 2-5mm | ME 2-5mm | GRME |
| 6 | GRSG | ME | Medium | 2-5mm | ME 2-5mm | GRSGME |
| 6 | PL | ME | Medium | 2-5mm | ME 2-5mm | PLME |
| 6 | PLAB | ME | Medium | 2-5mm | ME 2-5mm | PLABME |
| 6 | PLSB | ME | Medium | 2-5mm | ME 2-5mm | PLSBME |
| 6 | PR | ME | Medium | 20-50mm | ME 20-50mm | PRME |
| 6 | PRAB | ME | Medium | 20-50mm | ME 20-50mm | PRABME |
| 6 | PRSB | ME | Medium | 20-50mm | ME 20- | PRSBME |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | 50mm | |
| 6 | SB | ME | Medium | 10-20mm | ME 10-20mm | SBME |
| 6 | SBGR | ME | Medium | 10-20mm | ME 10-20mm | SBGRME |
| 7 | AB | FC | Fine to coarse | 5-50mm | FC 5-50mm | ABFC |
| 7 | ABGR | FC | Fine to coarse | 5-50mm | FC 5-50mm | ABGRFC |
| 7 | GR | FC | Fine to coarse | 1-10mm | FC 1-10mm | GRFC |
| 7 | GRSG | FC | Fine to coarse | 1-10mm | FC 1-10mm | GRSGFC |
| 7 | PL | FC | Fine to coarse | 1-10mm | FC 1-10mm | PLFC |
| 7 | PLAB | FC | Fine to coarse | 1-10mm | FC 1-10mm | PLABFC |
| 7 | PLSB | FC | Fine to coarse | 1-10mm | FC 1-10mm | PLSBFC |
| 7 | PR | FC | Fine to coarse | 10-100mm | FC 10-100mm | PRFC |
| 7 | PRAB | FC | Fine to coarse | 10-100mm | FC 10-100mm | PRABFC |
| 7 | PRSB | FC | Fine to coarse | 10-100mm | FC 10-100mm | PRSBFC |
| 7 | SB | FC | Fine to coarse | 5-50mm | FC 5-50mm | SBFC |
| 7 | SBGR | FC | Fine to coarse | 5-50mm | FC 5-50mm | SBGRFC |
| 8 | AB | MC | Medium to coarse | 10-50mm | MC 10-50mm | ABMC |
| 8 | ABGR | MC | Medium to coarse | 10-50mm | MC 10-50mm | ABGRMC |
| 8 | GR | MC | Medium to coarse | 2-10mm | MC 2-10mm | GRMC |
| 8 | GRSG | MC | Medium to coarse | 2-10mm | MC 2-10mm | GRSGMC |
| 8 | PL | MC | Medium to coarse | 2-10mm | MC 2-10mm | PLMC |
| 8 | PLAB | MC | Medium to coarse | 2-10mm | MC 2-10mm | PLABMC |
| 8 | PLSB | MC | Medium to coarse | 2-10mm | MC 2-10mm | PLSBMC |
| 8 | PR | MC | Medium to coarse | 20-100mm | MC 20-100mm | PRMC |
| 8 | PRAB | MC | Medium to coarse | 20-100mm | MC 20-100mm | PRABMC |
| 8 | PRSB | MC | Medium to coarse | 20-100mm | MC 20-100mm | PRSBMC |
| 8 | SB | MC | Medium to | 10-50mm | MC 10- | SBMC |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | coarse | | 50mm | |
| 8 | SBGR | MC | Medium to coarse | 10-50mm | MC 10-50mm | SBGRMC |
| 9 | AB | CO | Coarse | 20-50mm | CO 20-50mm | ABCO |
| 9 | ABGR | CO | Coarse | 20-50mm | CO 20-50mm | ABGRCO |
| 9 | GR | CO | Coarse | 5-10mm | CO 5-10mm | GRCO |
| 9 | GRSG | CO | Coarse | 5-10mm | CO 5-10mm | GRSGCO |
| 9 | PL | CO | Coarse | 5-10mm | CO 5-10mm | PLCO |
| 9 | PLAB | CO | Coarse | 5-10mm | CO 5-10mm | PLABCO |
| 9 | PLSB | CO | Coarse | 5-10mm | CO 5-10mm | PLSBCO |
| 9 | PR | CO | Coarse | 50-100mm | CO 50-100mm | PRCO |
| 9 | PRAB | CO | Coarse | 50-100mm | CO 50-100mm | PRABCO |
| 9 | PRSB | CO | Coarse | 50-100mm | CO 50-100mm | PRSBCO |
| 9 | SB | CO | Coarse | 20-50mm | CO 20-50mm | SBCO |
| 9 | SBGR | CO | Coarse | 20-50mm | CO 20-50mm | SBGRCO |
| 10 | AB | MV | Medium to very coarse | > 10mm | MV > 10mm | ABMV |
| 10 | ABGR | MV | Medium to very coarse | > 10mm | MV > 10mm | ABGRMV |
| 10 | GR | MV | Medium to very coarse | > 2mm | MV > 2mm | GRMV |
| 10 | GRSG | MV | Medium to very coarse | > 2mm | MV > 2mm | GRSGMV |
| 10 | PL | MV | Medium to very coarse | > 2mm | MV > 2mm | PLMV |
| 10 | PLAB | MV | Medium to very coarse | > 2mm | MV > 2mm | PLABMV |
| 10 | PLSB | MV | Medium to very coarse | > 2mm | MV > 2mm | PLSBMV |
| 10 | PR | MV | Medium to very coarse | > 20mm | MV > 20mm | PRMV |
| 10 | PRAB | MV | Medium to very coarse | > 20mm | MV > 20mm | PRABMV |
| 10 | PRSB | MV | Medium to very coarse | > 20mm | MV > 20mm | PRSBMV |
| 10 | SB | MV | Medium to very coarse | > 10mm | MV > 10mm | SBMV |
| 10 | SBGR | MV | Medium to very coarse | > 10mm | MV > 10mm | SBGRMV |
| 11 | AB | CV | Coarse to very coarse | > 20mm | CV > 20mm | ABCV |
| 11 | ABGR | CV | Coarse to | > 20mm | CV > 20mm | ABGRCV |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | very coarse | | | |
| 11 | GR | CV | Coarse to very coarse | > 5mm | CV > 5mm | GRCV |
| 11 | GRSG | CV | Coarse to very coarse | > 5mm | CV > 5mm | GRSGCV |
| 11 | PL | CV | Coarse to very coarse | > 5mm | CV > 5mm | PLCV |
| 11 | PLAB | CV | Coarse to very coarse | > 5mm | CV > 5mm | PLABCV |
| 11 | PLSB | CV | Coarse to very coarse | > 5mm | CV > 5mm | PLSBCV |
| 11 | PR | CV | Coarse to very coarse | > 50mm | CV > 50mm | PRCV |
| 11 | PRAB | CV | Coarse to very coarse | > 50mm | CV > 50mm | PRABCV |
| 11 | PRSB | CV | Coarse to very coarse | > 50mm | CV > 50mm | PRSBCV |
| 11 | SB | CV | Coarse to very coarse | > 20mm | CV > 20mm | SBCV |
| 11 | SBGR | CV | Coarse to very coarse | > 20mm | CV > 20mm | SBGRCV |
| 12 | AB | VC | Very coarse | > 50mm | VC > 50mm | ABVC |
| 12 | ABGR | VC | Very coarse | > 50mm | VC > 50mm | ABGRVC |
| 12 | GR | VC | Very coarse | > 10mm | VC > 10mm | GRVC |
| 12 | GRSG | VC | Very coarse | > 10mm | VC > 10mm | GRSGVC |
| 12 | PL | VC | Very coarse | > 10mm | VC > 10mm | PLVC |
| 12 | PLAB | VC | Very coarse | > 10mm | VC > 10mm | PLABVC |
| 12 | PLSB | VC | Very coarse | > 10mm | VC > 10mm | PLSBVC |
| 12 | PR | VC | Very coarse | > 100mm | VC > 100mm | PRVC |
| 12 | PRAB | VC | Very coarse | > 100mm | VC > 100mm | PRABVC |
| 12 | PRSB | VC | Very coarse | > 100mm | VC > 100mm | PRSBVC |
| 12 | SB | VC | Very coarse | > 50mm | VC > 50mm | SBVC |
| 12 | SBGR | VC | Very coarse | > 50mm | VC > 50mm | SBGRVC |

### *Table S_StructureStrength*

| IndexCol | StructureStrengthCode | StructureStrengthText | StructureStrengthDesc |
|---|---|---|---|
| 1 | WE | Weak | Aggregates barely visible in situ and only weak arrangement of natural surfaces that break when gently disturbed. |
| 2 | WM | Weak to moderate | Show weak and moderate properties |
| 3 | MO | Moderate | Aggregates are visible in situ and there is a distinct arrangement of |

| | | | |
|---|---|---|---|
| | | | material. When disturbed it breaks into a mixture of entire and broken aggregates. |
| 4 | MS | Moderate to strong | Show moderate and strong properties |
| 5 | ST | Strong | Aggregates are clearly visible in situ and there is prominent arrangement of material. When disturbed it breaks into distinct whole aggregates. |

### *Table S_StructureType*

| IndexCol | StructureTypeCode | StructureTypeText |
|---|---|---|
| 1 | GR | Granular |
| 2 | GRSG | Gran 2 Sgrain |
| 3 | AB | Angular blocky |
| 4 | ABGR | Angblk 2 Gran |
| 5 | SB | Sub-angular blocky |
| 6 | SBGR | Sngblk 2 Gran |
| 7 | PR | Prismatic |
| 8 | PRAB | Prm 2 Angblk |
| 9 | PRSB | Prm 2 Sngblk |
| 10 | PL | Platy |
| 11 | PLAB | Ply 2 Angblk |
| 12 | PLSB | Ply 2 Sngblk |
| 13 | SG | Single Grain |
| 14 | MA | Massive |
| 15 | MASG | Mas 2 Sgrain |
| 16 | MAAB | Mas 2 Angblk |

### *Table S_SUBGRP*

| SUBGROUP | SUBGP_NAME | Subgr_Code |
|---|---|---|
| 111 | Typical Lithosols | 111 Typical Lithosols |
| 112 | Humic Lithosols | 112 Humic Lithosols |
| 113 | Histic Lithosols | 113 Histic Lithosols |
| 211 | Typical Rendzinas | 211 Typical Rendzinas |
| 212 | Gleyic Rendzinas | 212 Gleyic Rendzinas |
| 213 | Humic Rendzinas | 213 Humic Rendzinas |
| 214 | Stagnic Rendzinas | 214 Stagnic Rendzinas |
| 215 | Histic Rendzinas | 215 Histic Rendzinas |
| 311 | Typical Brown Earths | 311 Typical Brown Earths |
| 312 | Gleyic Brown Earths | 312 Gleyic Brown Earths |
| 313 | Humic Brown Earths | 313 Humic Brown Earths |
| 314 | Stagnic Brown Earths | 314 Stagnic Brown Earths |

| | | |
|---|---|---|
| 315 | Stagni-humic Brown Earths | 315 Stagni-humic Brown Earths |
| 321 | Typical Calcareous Brown Earths | 321 Typical Calcareous Brown Earths |
| 322 | Gleyic Calcareous Brown Earths | 322 Gleyic Calcareous Brown Earths |
| 323 | Stagnic Calcareous Brown Earths | 323 Stagnic Calcareous Brown Earths |
| 411 | Typical Luvisols | 411 Typical Luvisols |
| 412 | Gleyic Luvisols | 412 Gleyic Luvisols |
| 413 | Humic Luvisols | 413 Humic Luvisols |
| 414 | Stagnic Luvisols | 414 Stagnic Luvisols |
| 511 | Typical Brown Podzolics | 511 Typical Brown Podzolics |
| 512 | Gleyic Brown Podzolics | 512 Gleyic Brown Podzolics |
| 513 | Humic Brown Podzolics | 513 Humic Brown Podzolics |
| 514 | Stagnic Brown Podzolics | 514 Stagnic Brown Podzolics |
| 611 | Ferric Podzols | 611 Ferric Podzols |
| 612 | HumoFerric Podzols | 612 HumoFerric Podzols |
| 621 | Typical Gley Podzols | 621 Typical Gley Podzols |
| 622 | Stagno-Gley Podzols | 622 Stagno-Gley Podzols |
| 631 | Ferric Stagno-Podzols | 631 Ferric Stagno-Podzols |
| 632 | Iron-pan Stagno-Podzols | 632 Iron-pan Stagno-Podzols |
| 711 | Typical Surface-water Gleys | 711 Typical Surface-water Gleys |
| 712 | Humic Surface-water Gleys | 712 Humic Surface-water Gleys |
| 721 | Typical Groundwater Gleys | 721 Typical Groundwater Gleys |
| 722 | Humic Groundwater Gleys | 722 Humic Groundwater Gleys |
| 723 | Calcareous Groundwater Gleys | 723 Calcareous Groundwater Gleys |
| 724 | Humic Calcareous Groundwater Gleys | 724 Humic Calcareous Groundwater Gleys |
| 731 | Typical Undifferentiated Gleys | 731 Typical Undifferentiated Gleys |
| 811 | Typical Brown Alluvial Soils | 811 Typical Brown Alluvial Soils |
| 812 | Gleyic Brown Alluvial Soils | 812 Gleyic Brown Alluvial Soils |
| 813 | Humic Brown Alluvial Soils | 813 Humic Brown Alluvial Soils |
| 821 | Typical Alluvial Gleys | 821 Typical Alluvial Gleys |
| 822 | Humic Alluvial Gleys | 822 Humic Alluvial Gleys |
| 823 | Typical Calcareous Alluvial Gleys | 823 Typical Calcareous Alluvial Gleys |
| 824 | Humic Calcareous Alluvial Gleys | 824 Humic Calcareous Alluvial Gleys |
| 911 | Raw Ombrotrophic Peat Soils | 911 Raw Ombrotrophic Peat Soils |
| 912 | Earthy Ombrotrophic Peat Soils | 912 Earthy Ombrotrophic Peat Soils |
| 913 | Cut-over Ombrotrophic Peat Soils | 913 Cut-over Ombrotrophic Peat Soils |
| 914 | Industrial Ombrotrophic Peat Soils | 914 Industrial Ombrotrophic Peat Soils |
| 921 | Raw Minerotrophic Peat Soils | 921 Raw Minerotrophic Peat Soils |
| 922 | Earthy Minerotrophic Peat Soils | 922 Earthy Minerotrophic Peat Soils |
| 1011 | Terric Anthrosols | 1011 Terric Anthrosols |
| 1012 | Stagni-terric Anthrosols | 1012 Stagni-terric Anthrosols |
| 1020 | Technosols | 1020 Technosols |

### *Table S_SubstrateSubgroup*

| SubstratetypeCode | SubstrateSubgroupCode | SubstrateSubgroupText |
|---|---|---|
| PT | BOG | Blanket bog |
| PT | CUT | Cutover |
| AE | DUN | Sand dunes (wind-blown sand) |
| AL | EST | Estuarine |
| PT | FEN | Fen |
| RK | GNS | Gneiss and schist |
| DR | GRC | Gravels calcareous |
| DR | GRN | Gravels non-calcareous |
| RK | IBG | Igneous basic |
| RK | IGA | Igneous acid |
| DR | IGM | Igneous + metamorphic stones |
| AL | LAK | Lake marl |
| RK | LIM | Limestone |
| DR | LIM | Limestones |
| DI | MAD | Made ground |
| AL | MAR | Marine |
| DR | NON | Stoneless |
| AL | RIV | River |
| RK | SAN | Sandstone |
| RK | SHL | Shale/slate |
| DR | SIL | Siliceous stones |
| RK | SSH | Sandstones and shales |

### *Table S_SubstrateType*

| SubstrateTypeCode | SubstrateTypeText |
|---|---|
| AE | Aeolian |
| AL | Alluvium |
| DI | Disturbed |
| DR | Drift |
| PT | Peat |
| RK | Bedrock |

### *Table S_SubType*

| SubTypeCode | SubTypeText |
|---|---|
| | None |
| AR | Argillaceous (marly) |
| CA | Calcareous |
| CB | Carbaceous (black) |
| DO | Dolomitic |
| FE | Ferruginous |

| | |
|---|---|
| FL | Felspathic (arkosic) |
| GL | Glauconitic |
| HA | Haematitic (red) |
| MI | Micaceous |
| SA | Sandy |

### *Table S_Texture*

| TextureCode | TextureText |
|---|---|
| LP | Loamy Peat |
| P | Peat |
| PL | Peaty Loam |
| PS | Peaty Sand |
| SP | Sandy Peat |

### *Table S_Troels*

| TroelsCode | TroelsText |
|---|---|
| | None |
| Ag | A. granosa |
| As | A. steatodes |
| Dg | D. granosus |
| Dh | D. herbosus |
| Dl | D. lignosus |
| Ga | G. arenosa |
| Gg (maj.) | G. glareosa majora |
| Gg (min.) | G. glareosa minora |
| Gs | G. saburralia |
| Lc | L. calcareus |
| Ld 0-4 | L. detrituosus |
| Lf | L. ferrugineus |
| Lso | L. siliceus organogenes |
| Sh | Substantia humosa |
| Tb 0-4 | T. bryophytica |
| Th 0-4 | T. herbacea |
| Tl 0-4 | T. lignosa |

### *Table S_TroelsAbundance*

| TroelsABCode | TroelsAbText |
|---|---|
| + | Trace |
| 0 | Absent |
| 1 | Minor presence (1/4) |
| 2 | Medium presence (2/4) |
| 3 | Major presence (3/4) |

| | |
|---|---|
| 4 | Sole presence (4/4) |

### *Table S_Vegetaton*

| VegetationCode | VegetationText |
|---|---|
| CO | Coniferous |
| DE | Deciduous |
| EV | Evergreen |
| GR | Grassland |
| HR | Heather |
| MX | Mixed |
| RU | Rushes |

### *Table S_Voids*

| IndexCol | VoidsCode | VoidsText | VoidsPC | Voids |
|---|---|---|---|---|
| 1 | VF | Very Fine | < 0.5mm | VF < 0.5mm |
| 2 | F | Fine | 0.5-2 mm | F 0.5-2 mm |
| 3 | M | Medium | 2-5 mm | M 2-5 mm |
| 4 | C | Coarse | 5-20 mm | C 5-20 mm |
| 5 | VC | Very Coarse | 20-50mm | VC 20-50mm |

### *Table S_VonPost*

| IndexCol | VonPostCode | VonPostText | VonPost |
|---|---|---|---|
| 1 | H1 | Undecomposed | H1 Undecomposed |
| 2 | H2 | Almost undecomposed | H2 Almost undecomposed |
| 3 | H3 | Very weakly decomposed | H3 Very weakly decomposed |
| 4 | H4 | Weakly decomposed | H4 Weakly decomposed |
| 5 | H5 | Moderately decomposed | H5 Moderately decomposed |
| 6 | H6 | Well decomposed | H6 Well decomposed |
| 7 | H7 | Strongly decomposed | H7 Strongly decomposed |
| 8 | H8 | Very strongly decomposed | H8 Very strongly decomposed |
| 9 | H9 | Almost completely decomposed | H9 Almost completely decomposed |
| 10 | H10 | Completely decomposed | H10 Completely decomposed |

### *Table S_Weather*

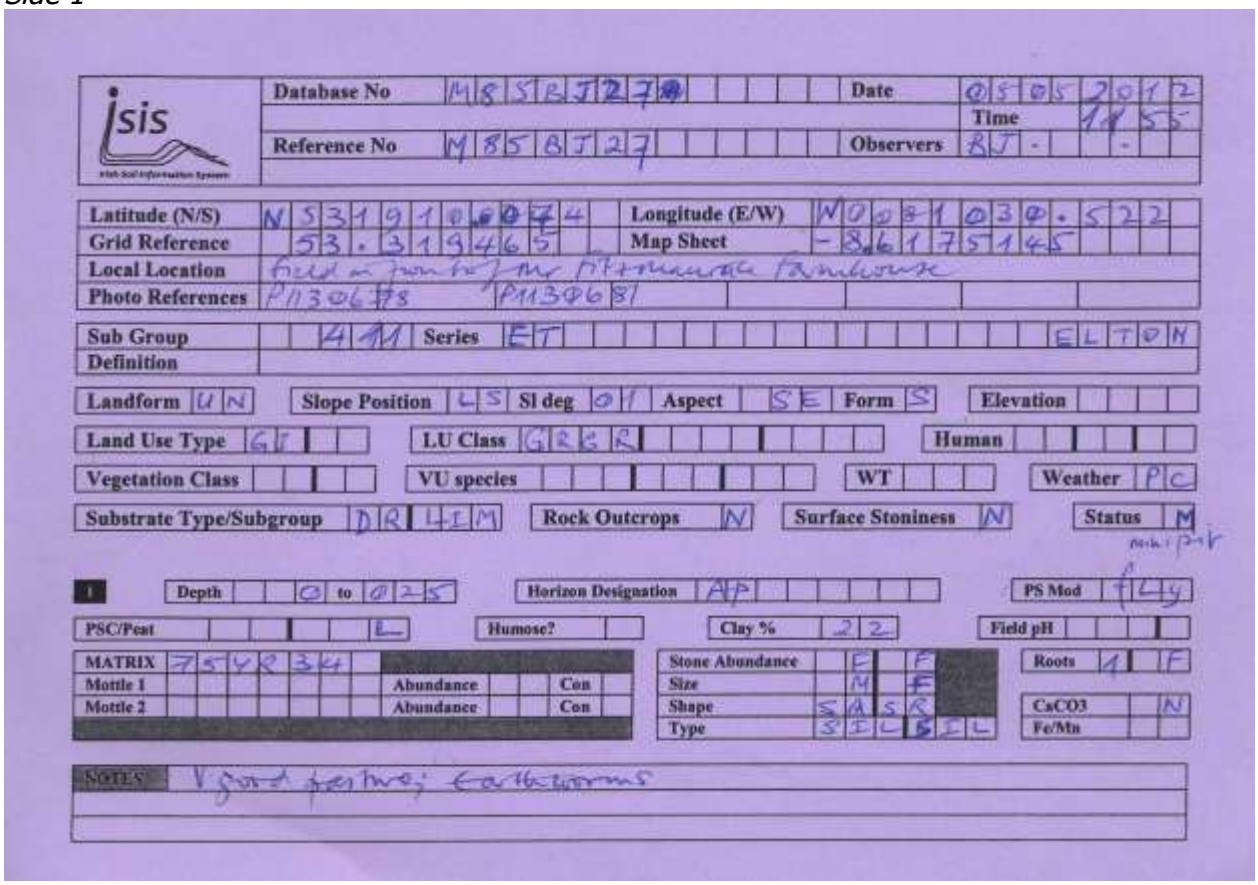
| WeatherCode | WeatherText |
|---|---|
| OV | Overcast |
| PC | Partly cloudy |
| RA | Rain |
| SL | Sleet |
| SN | Snow |

| | |
|---|---|
| SU | Sunny/clear |

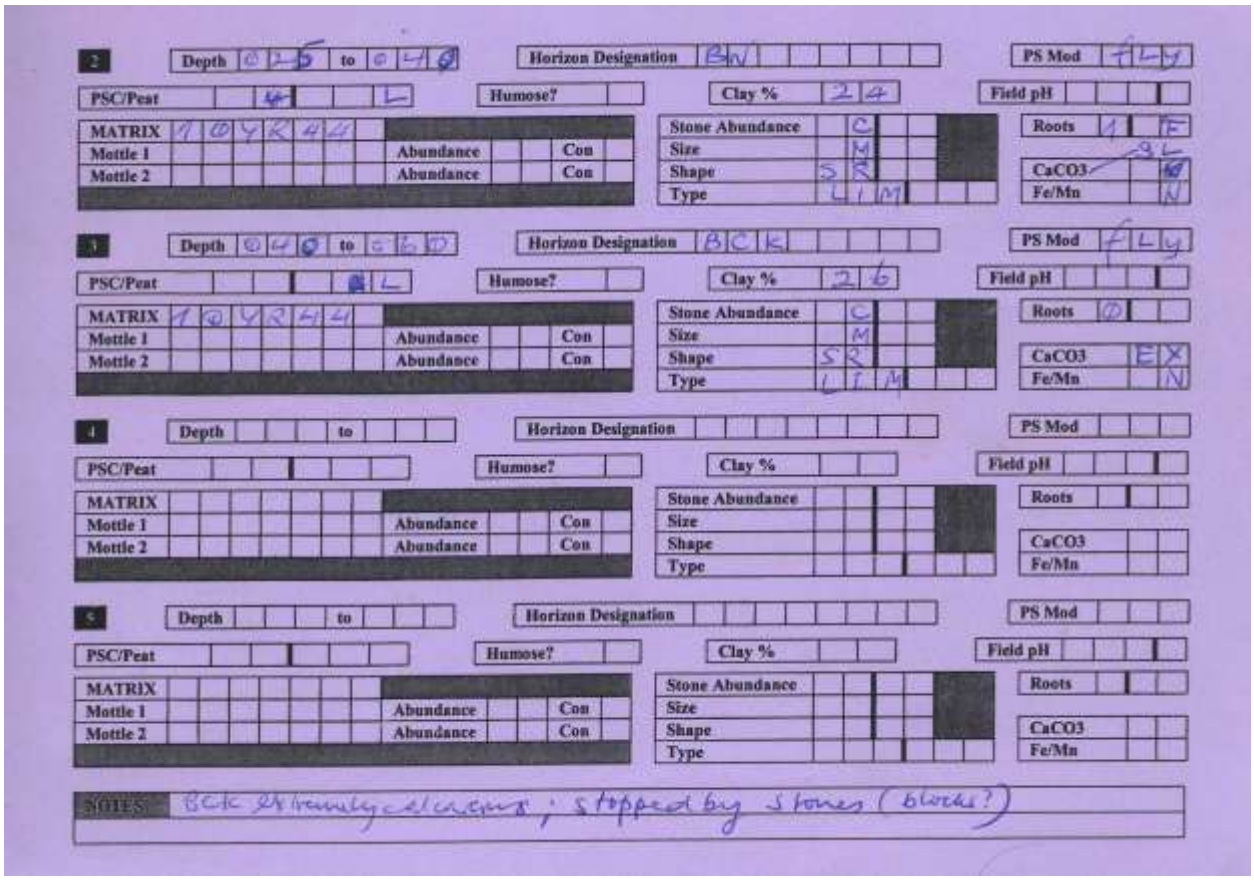
## Appendix Three: Example paper cards used for recording Representative Profiles

A paper card was created to allow recording of representative profiles in the field and subsequent entry into the database. This is a two sided card shown below with a completed example for Roscommon.

*Side 1*



*Side 2*


2
Depth 025 to 040
Horizon Designation BW
PS Mod FLy
PSC/Peat L
Humose?
Clay % 24
Field pH
MATRIX 10YR44
Mottle 1
Mottle 2
Abundance Con
Abundance Con
Stone Abundance C
Size M
Shape SR
Type L I M
Roots 1 F
CaCO3 9L
Fe/Mn M
3
Depth 040 to 060
Horizon Designation BCk
PS Mod FLy
PSC/Peat L
Humose?
Clay % 26
Field pH
MATRIX 10YR44
Mottle 1
Mottle 2
Abundance Con
Abundance Con
Stone Abundance C
Size M
Shape SR
Type L I M
Roots 0
CaCO3 EX
Fe/Mn N
4
Depth to
Horizon Designation
PS Mod
PSC/Peat
Humose?
Clay %
Field pH
MATRIX
Mottle 1
Mottle 2
Abundance Con
Abundance Con
Stone Abundance
Size
Shape
Type
Roots
CaCO3
Fe/Mn
5
Depth to
Horizon Designation
PS Mod
PSC/Peat
Humose?
Clay %
Field pH
MATRIX
Mottle 1
Mottle 2
Abundance Con
Abundance Con
Stone Abundance
Size
Shape
Type
Roots
CaCO3
Fe/Mn
NOTES Bck strongly calcareous; stopped by stones (blocks?)

~oOo~