# HOW TO COMPLETE THE SOIL PROFILE DESCRIPTION RECORDING FORMS 'RUFFs'

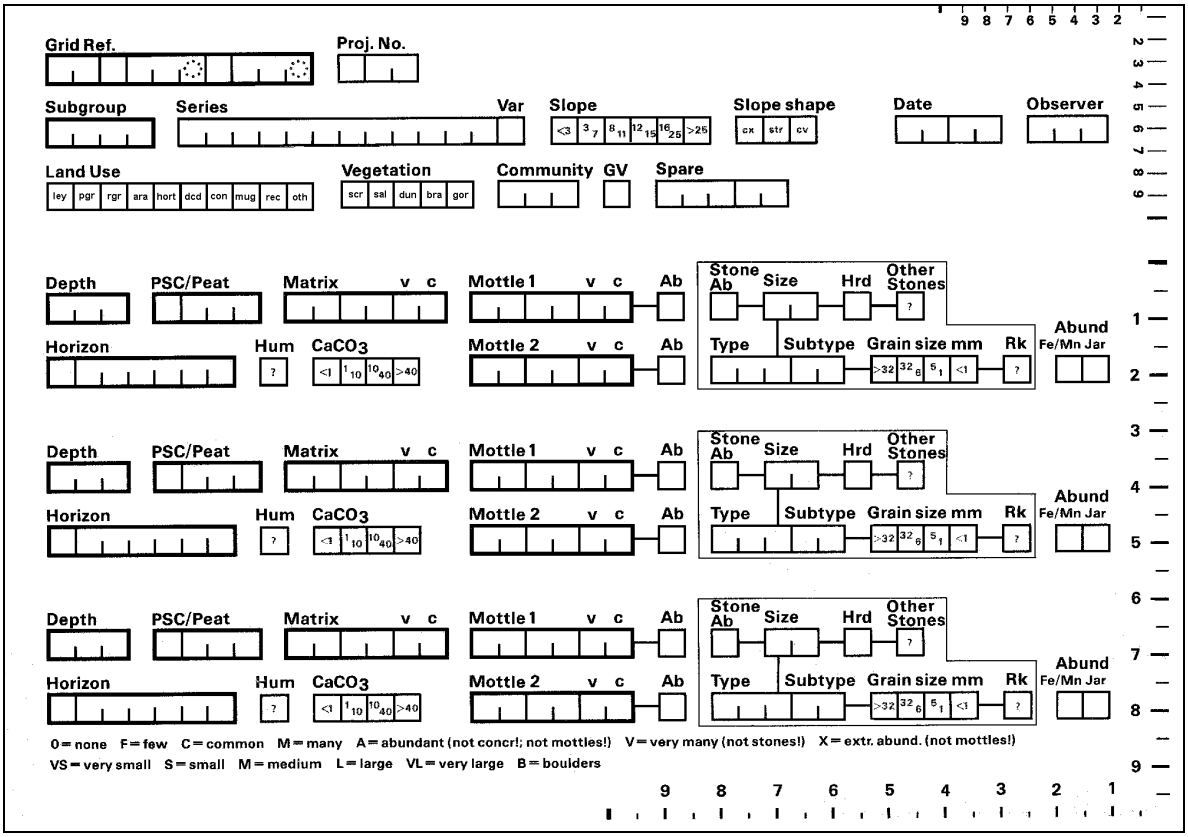
Taken from the original document

**'HOW TO COMPLETE THE NEW RECODING FORMS'**

dated 6 May 1983

compiled by
**R.G.O. Burton**

Front




Reverse

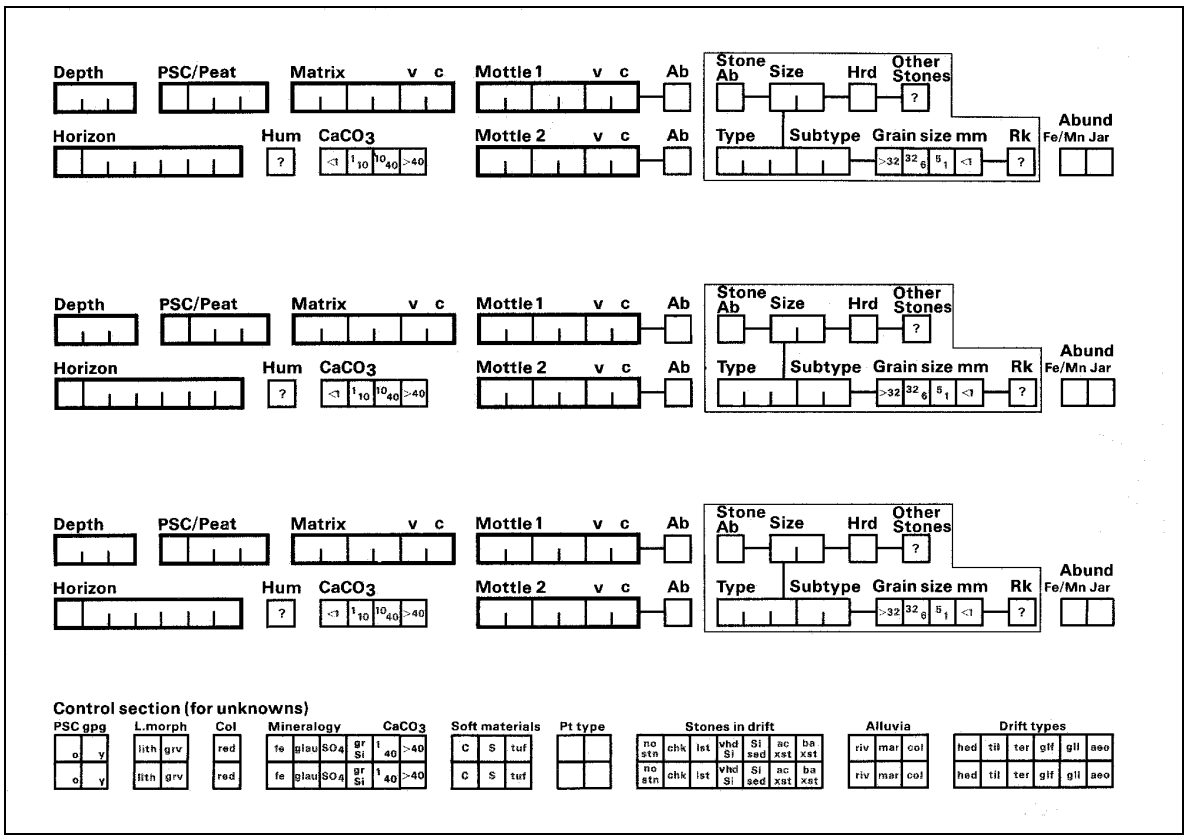



**Figure 1. The soil profile description card (RUFF) used to record site and soil information from auger bores (70% of actual size).**

# Introduction

The field description cards (Ragg User Friendly Forms, or RUFFs) were designed to cater for semi-detailed, detailed and *ad hoc* surveys. The two-sided forms (Figure 1) give a wide scope for logging the main site characteristics and up to six soil horizons (with continuation onto a second and third card if necessary). Some boxes merely require the correct item/class to be ticked, although some need text or codes for data entry. Write clearly to allow others to read or enter the information into a computer. Use upper case text throughout, except in the Horizon section where the correct notation should be followed.

# Site Section

- **Grid reference**

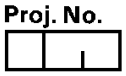

A standard Ordnance Survey format is used. The index letters for the 100 x 100 km sheet are entered in the first two boxes, *e.g.* TL, followed by the Eastings of three figures (to 100 m accuracy) or four figures (to 10 m accuracy), then by the Northings similarly of three or four figures. The dotted zeroes may be overwritten to obtain a unique 10 m grid reference.

Example: 

100m accuracy

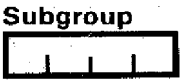
10m accuracy

- **Project number** (Proj. No.)




Use an approved code of up to three digits. Bores made at the same point, *e.g.* at a 1 km grid intersect, will bear the same grid reference but can be distinguished by project number.

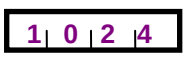
- **Subgroup**




Enter the subgroup code, right justified, without the decimal point.

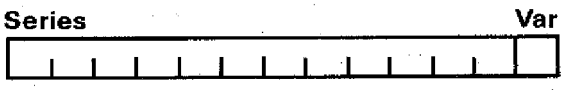
Example 

5.72

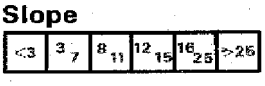


10.24

- **Series**

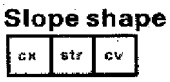



Make every effort to identify the profile at series level if possible. If the series encountered is not known because of insufficient evidence, UN is entered for 'unknown'. If a 'slot' in the classification is identified but there is no name available, NN is entered for 'not named'. If the series cannot be identified but it is worth recording a 'near miss' name, enter this series name and tick the Var box for 'variant' (and complete the Control Section part of the form – currently this last action is optional).

- **Slope** 

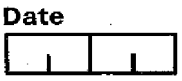

Tick one box to select the slope.

| Slope Range | Definition |
|---|---|
| <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 |

- **Slope shape** 


Tick one box for slope shape:

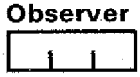
| Code | Slope shape descriptor |
|---|---|
| cx | convex |
| str | straight |
| cv | concave |

- **Date** 


Enter digits for the month in the two left hand boxes and the final digits of the year in the two right-hand boxes. The space to the left of these boxes can be used to write down the day of the month (*preferred option*) for the user's own convenience.

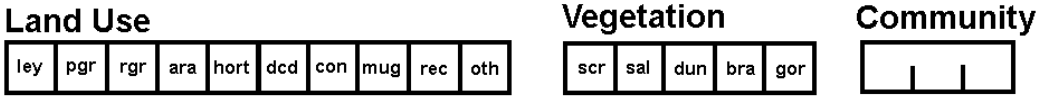
Example: 

April 1998

- **Observer** 


Enter unique two- or three-letter initials.

**Land Use, Vegetation & Community**



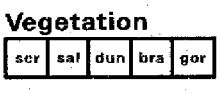
- **Land Use**


Tick one box to select land use from the following:

| Land Use | |
|---|---|
| Ley grassland | ley |
| Permanent grassland | pgr |
| Enclosed rough grassland | rgr |
| Arable | ara |
| Horticulture | hort |
| Deciduous woodland | dcd |
| Coniferous woodland | con |
| Made-up ground | mug |
| Recreation, including public open space, golf course, caravan park, beach | rec |
| Other use | oth |

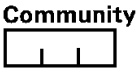
If the vegetation boxes are used there is no need to tick a land use box.

- **Vegetation**




This field refers mainly to rough or unenclosed land and identifies the categories of scrub (scr), saltmarsh (sal), dune (dun), bracken (bra) and gorse (gor), plus 3 blank boxes for grassland, bog and heath community codes listed below. If the vegetation boxes are used there is no need to tick a land use box. A land use box must be ticked if the vegetation community is not filled in. The bracken and gorse boxes are used only where these species are dominant, or (preferably) in conjunction with a community abbreviation:

- **Community**




One code is entered where appropriate.

| Grasslands | | | |
|---|---|---|---|
| Rye-grass crested dog's tail | RG | Bristle-leaved bent | BL |
| Dune | DU | Rush pasture | RU |
| Crested hairgrass | CH | Nardus (white bent) | NA |
| Sweet vernal - Yorkshire fog | SV | Rock-rose - fescue | RF |
| Meadow grass - bent | MB | Tufted hair-grass (*Deschampsia caespitosa*) | TH |
| Blue sesleria | BS | Molinia (flying bent) | MO |
| Bent-fescue | BF | | |

| Swamps and bogs | | Mountain ("Alpine") vegetation | |
|---|---|---|---|
| Marsh marigold meadow | MM | Viviparous fescue | VF |
| Meadow sweet meadow | MS | Stiff sedge | SS |
| Yellow flag swamp | YF | Heath-rush | HR |
| Sedge mires | SM | Club-moss (alpine) | CM |
| Bog-moss water track | BM | Lichen heath (alpine) | LH |
| Blanket bog | BB | Rhacomitrium heath | RH |
| Reed swamp | RE | | |
| Sphagnum bog | SP[1] | | |

| Moorlands and heaths | |
|---|---|
| Dry heather moor | DH |
| Moist heather moor | MH |
| Bog heather moor | BH |
| Vaccinium heath (bilberry) | VH |

Specifying the type of crop may be achieved by entering a two- or three-letter abbreviation in the 'community' boxes. The abbreviations are as follows:

| Arable Crops | | Horticulture | | Orchards | |
|---|---|---|---|---|---|
| Wheat | WH | Flowers/bulbs | FL | Apples | AP |
| Barley | BA | Beans | BE | Pears | PR |
| Oats | OA | Leeks | LE | Plums or cherries | PL |
| Rye | RY | Lettuce | LT | | |
| Maize | MA | Nursery | NU | | |
| Oil-seed rape | OS | Onions | ON | | |
| Fodder crops (kale, mangolds, swedes, etc) | FC | Peas | PE | | |
| | | Soft fruit | SF | | |
| Mustard | MU | Vines | VI | | |
| Potatoes | PO | Cabbage[1] | CA | | |
| Sugar beet | SB | Celery[1] | CE | | |
| Carrots[1] | CA | | | | |
| Root crops (parsnips, etc) | RO | | | | |
| Linseed[1] | LS | | | | |
| Hops | HO | | | | |
| Fallow | FA | | | | |
| Set aside, stewardship, etc[1] | SA | | | | |

Winter and spring barley can be indicated by prefixing the appropriate abbreviation by W or S, *e.g.* WBA - winter barley. Similarly potato crops can be identified by the prefix letters E and M for 'early' and 'main-crop', *e.g.* EPO - early potatoes.

1 category added since original version

- **Grazing value** (GV)

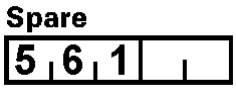

One of the codes is entered:

| Relative Grazing Value | | Code |
|---|---|---|
| >8 | Very Good | V |
| 5–8 | Good | G |
| 2–4 | Moderate | M |
| <2 | Poor | P |

- **Spare**

(these data are for the convenience of the user but will not be included in LandIS)

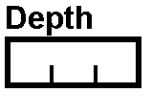
There are 3 plus 2 boxes that may be used. The first three boxes can be used for field-determined pH (1:1 in water) of the topsoil (0-5 cm depth), to two decimal places and omitting the decimal point, for example:




Additional information written on the card is not normally recorded, but for the Nuclear Sites surveys, for example, the consecutive Bore No. placed in the space at the top right-hand corner of the card has been allocated to the 'USER_1' field in the computer input program RUFFS.EXE to link computer generated data sorted by Grid Reference or other field, with the actual hand-written card for easy selection of the card when checking. A further useful parameter included is the altitude of the site (as 'USER_2') in metres above Ordnance Datum, read from the map using contour lines and spot heights as a guide.

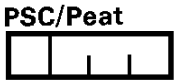
## Soil Horizon Section – mineral horizons

- **Depth**




The *lower* depth limit of the horizon is recorded.

- **PSC/Peat**

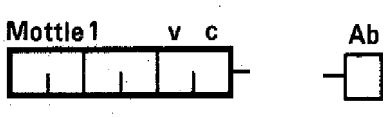



Four boxes are available to record Particle-size Class (PSC) or Peat texture, with the left-most box being used for the moderator (e.g. sand grade of fine (f), medium (m) or coarse (c)) and the remaining three boxes for the recognised texture abbreviation, as indicated in Figure 2.

- **Colour**


Soil colours are determined by comparison with the standard Soil Color Charts of the Munsell Color Company, Baltimore, USA. The codes for these colours are used and occupy six boxes, consisting of two numbers, two letters and two numbers. This applies to the boxes for the matrix colour and the colours of the two main mottles, if any.

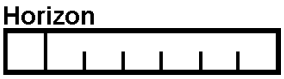
- **Mottle Abundance**




Mottle intensity and abundance are an indication of soil wetness. Abundance (Ab) is determined with reference to the Soil Survey Field Handbook (p. 17) and coded as follows:

| % | Mottle Abundance | Code |
|---|---|---|
| | None | 0 |
| <2 | Few | F |
| 2–20 | Common | C |
| 20–40 | Many | M |
| >40 | Very many | V |

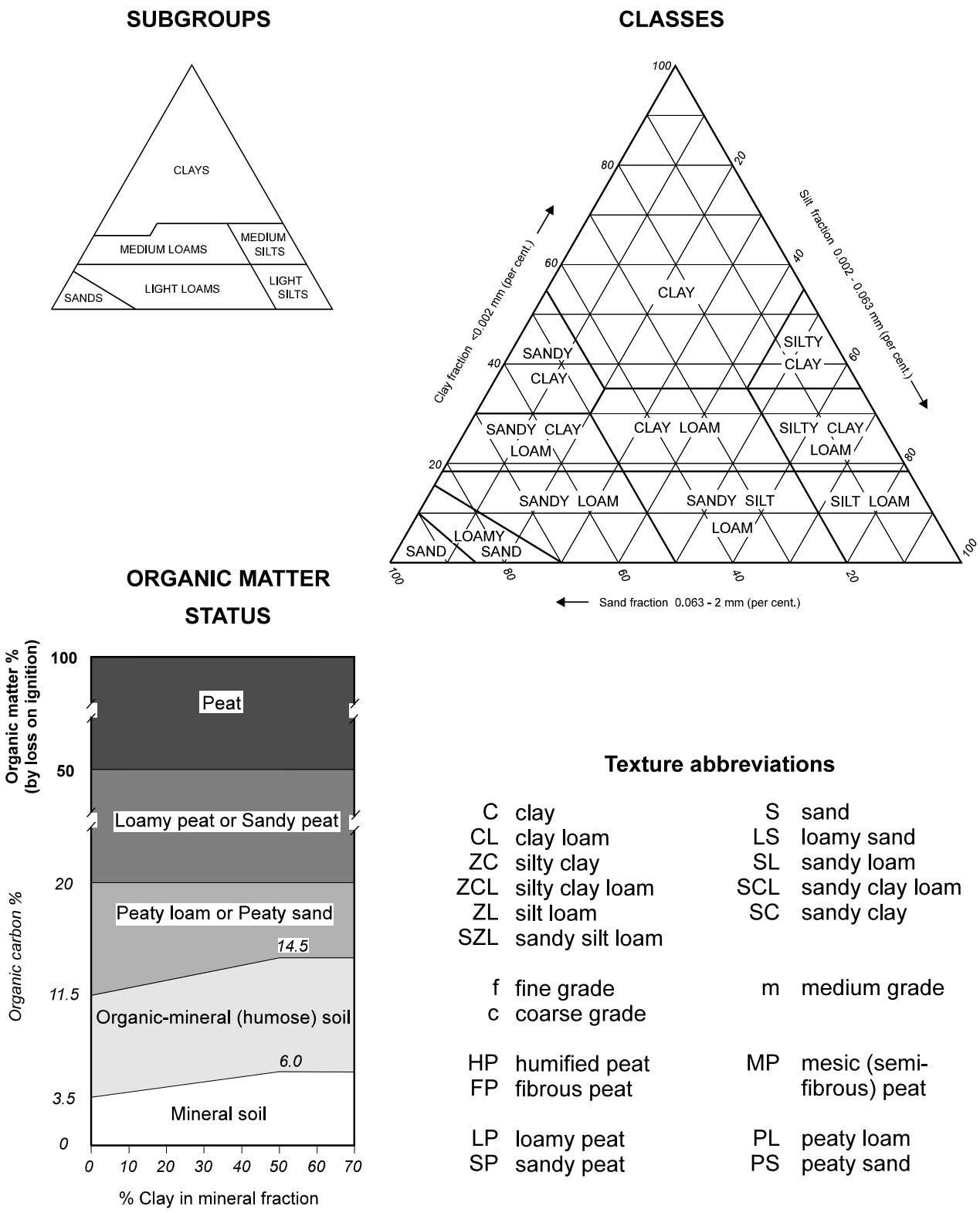
- **Horizon**




Soil horizons are usually designated A, E, B, BC, C and R in a sequence from the ground surface downwards; highly organic horizons, wherever they occur in the soil profile, are designated O if caused by waterlogging, or L, H or F if derived from surface litter accumulations. These are entered as one or two upper case letters starting from the second box from the left.

Prefixes and suffixes are used for more precise allocation. These should be entered as lower case letters and numbers in accordance with instructions in the Soil Survey Field Handbook (p. 83), *e.g.* Ap, Bw(g), BCg. Horizons qualifying for the same letter notation and occurring in vertical sequence are denoted by numerals placed after the letter designation, *e.g.* Bw1 and Bw2. A litholigical discontinuity is indicated by a numerical prefix placed in the first box on the left, *e.g.* 2Bw(g), 3Cg. A buried horizon is given the prefix b in the first box on the left, *e.g.* bAh. In bisequal profiles formed by successive phases of horizon development, horizons in the lower sequum are distinguished by a prime accent, *e.g.* B't.

**Soil texture subgroups and classes, and organic matter status**




**Texture abbreviations**

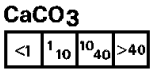
| | | | |
|---|---|---|---|
| C | clay | S | sand |
| CL | clay loam | LS | loamy sand |
| ZC | silty clay | SL | sandy loam |
| ZCL | silty clay loam | SCL | sandy clay loam |
| ZL | silt loam | SC | sandy clay |
| SZL | sandy silt loam | | |
| f | fine grade | m | medium grade |
| c | coarse grade | | |
| HP | humified peat | MP | mesic (semi-fibrous) peat |
| FP | fibrous peat | | |
| LP | loamy peat | PL | peaty loam |
| SP | sandy peat | PS | peaty sand |

**Figure 2. Soil texture classes and subgroups, and organic matter status.**

- **Organic Matter** (OM)


The Hum ? box is ticked if the soil horizon is assessed as a humose mineral soil (see Fig.2, organic matter status). Leave the box blank for peat soil material.

- **Calcium Carbonate Content**

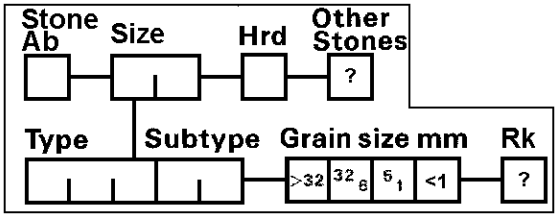



The appropriate $CaCO_3$ percentage class box is ticked to indicate the carbonate content, estimated by applying dilute hydrochloric acid to the soil sample. The choices are:

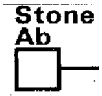
| Carbonate descriptor | % Class Code |
|---|---|
| Non-calcareous | <1 |
| Calcareous | 1 10 |
| Very calcareous | 10 40 |
| Extremely calcareous | >40 |

- **Stones**

Stone abundance, size, hardness, lithology and lithological sub-type are recorded for the main stone type. Grain size is also an option as is whether any other stone type is present.



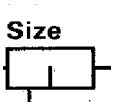

- **Stone abundance**




One of the following codes is entered:

| % | Abundance descriptor | Code |
|---|---|---|
| <1 | Stoneless | 0 |
| 1–5 | Few stones | F |
| 6–15 | Common stones | C |
| 16–35 | Many stones | M |
| 35–70 | Abundant stones | A |
| >70 | Extremely abundant stones | X |

- **Stone size**

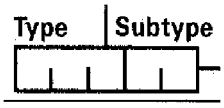



One of the following codes is entered:

| Size | Size descriptor | Code |
|---|---|---|
| 2–6 mm | Very small | VS |
| 6 mm–2 cm | Small | S |
| 2–6 cm | Medium | M |
| 6–20 cm | Large | L |
| 20–60 cm | Very large | VL |
| >60 cm | Boulders | B |

- **Stone hardness** 


Enter V (very hard), H (hard) or S (soft) in accordance with definitions in the Field Handbook (p. 82).

- **Stone lithology and sub-type** 


The type of stone, and sub-type if any, are recorded in three and two boxes respectively. The following abbreviations are used:

**Types**

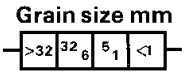
| Sedimentary | | | |
|---|---|---|---|
| Flint | FLI | Greywacke | GWK |
| Chert | CHE | Breccia | BRE |
| Quartzite | QTZ | Conglomerate | CON |
| Mudstone | MUD | Limestone | LST |
| Cleaved mudstone | CLM | Shelly limestone | SHL |
| Clay shale | CSH | Oolitic limestone | OOL |
| Siltstone | ZST | Pisolitic limestone | PIL |
| Silty shale | ZSH | Calcite mudstone | CAM |
| Quartzitic sandstone | QST | Chalk | CHA |
| Sandstone | SST | Coal | COA |
| Grit | GRT | Shale | SHA |

| Igneous | | Metamorphic | |
|---|---|---|---|
| Acid | ACI | Hornfels | HOR |
| Acid-intermediate | A–I | Quartzite | QTZ |
| Basic-intermediate | B–I | Slate | SLA |
| Basic | BAS | Phyllite | PHY |
| Ultrabasic | UBA | Mica schist | MIS |
| Serpentine | SER | Hornblende schist | HOS |
| Agglomerate | AGG | Acid gneiss | ACG |
| Volcanic breccia | VBR | Basic gneiss | BAG |
| Tuff | TUF | | |
| Glass | GLA | | |
| Pumice | PUM | | |

| Sub-types | | | |
|---|---|---|---|
| calcareous | CA | glauconitic | GL |
| micaceous | MI | dolomitic | DO |
| haematitic (red) | HA | sandy | SA |
| carbonaceous (black) | CB | argillaceous (marly) | AR |
| ferruginous | FE | green | GR |
| felspathic (arkosic) | FL | | |

All artefacts, bricks, tiles, ashes, blue willow-pattern plates, clay pipe stems, glass, *etc.* are entered as ART.

- **Grain size**




Grain size can be used to record the 'texture' of igneous, metamorphic and sedimentary rock and stones. The options are:

| Size descriptor | Size Code (mm) |
|---|---|
| very coarse | >32 |
| coarse | 32-6 |
| medium | 5–1 |
| fine | <1 |

Very coarse usually refers to agglomerates and breccias. When identifying igneous rocks ignore individual phenocrysts and record only the grain size of the interstitial material.

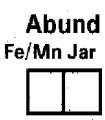
- **Rock**


If rock (Cr or Cu horizon) is encountered at the base of the profile, use the Stone boxes to record lithology and tick the Rk ? box

- **Abundance of ferri-manganiferous nodules**


Ferri-manganiferous nodules are an indication of wetness, and are particularly useful in reddish coloured soils in which mottles do not form clearly. An abundance code can be entered, F few (<2% of the volume of the horizon), C common (2–20%), M many (20–40%) and V very many (>40%).

- **Abundance of Jarosite**



Jarosite is a basic sulphate that forms as yellow mottles in mineral soil material and is an indication of strong acidity (pH values less than 4). An abundance code can be entered, F few (<2% of the volume of the horizon), C common (2–20%), M many (20–40%) and V very many (>40%).

## Soil Horizon Section – organic horizons

The instructions for mineral soil horizons for Depth, Colour (matrix colour), Horizon and Calcium Carbonate Content apply also to organic soil horizons. Boxes used for PSC/Peat, Colour of Mottle 1 and Mottle 2, Mottle Abundance and Stone Lithology can be used for recording characteristics unique to organic (peat) soils and deposits.

- **PSC/Peat**

Use the left-hand box for the von Post code from 1 (H1 undecomposed) to 9 (H9 almost completely decomposed), as set out in Table 1, *i.e.* omitting the prefix H. H10 (completely decomposed) has to be entered as 9.

**Table 1. Modified version of the von Post scale for assessing the degree of decomposition of peat.**
In this field test a sample of wet peat is squeezed in the closed hand and the colour of the liquid that is expressed between the fingers, the proportion of the original sample that is extruded and the nature of the plant residues are observed.

| RUFF code | Degree of decomp-osition | Nature of liquid expressed on squeezing | Proportion of peat extruded between fingers | Nature of plant residues | Description |
|---|---|---|---|---|---|
| 1 | H1 | Clear, colourless | None | Plant structure unaltered; fibrous, elastic | Undecomposed |
| 2 | H2 | Almost clear, yellow-brown | None | Plant structure distinct; almost unaltered | Almost undecomposed |
| 3 | H3 | Slightly turbid, brown | None | Plant structure distinct; most remains easily identifiable | Very weakly decomposed |
| 4 | H4 | Strongly turbid, brown | None | Plant structure distinct; most remains identifiable | Weakly decomposed |
| 5 | H5 | Strongly turbid, contains a little peat in suspension | Very little | Plant structure clear but becoming indistinct; most remains difficult to identify | Moderately decomposed |
| 6 | H6 | Muddy, much peat in suspension | One-third | Plant structure indistinct but clearer in the squeezed residue than in undisturbed peat; most remains unidentifiable | Well decomposed |
| 7 | H7 | Strongly muddy | One-half | Plant structure indistinct but recognisable; few remains identifiable | Strongly decomposed |
| 8 | H8 | Thick mud, little free water | Two-thirds | Plant structure very indistinct; only resistant remains such as root fibres and wood identifiable | Very strongly decomposed |
| 9 | H9 | No free water | Nearly all | Plant structure almost unrecognisable; practically no identifiable remains | Almost completely decomposed |
| 9 | H10 | No free water | All | Plant structure unrecognisable; completely amorphous | Completely decomposed |

Use the three right-hand boxes for the nature of the material, entered as an abbreviation given in Figure 2, *e.g.* LP for loamy peat, PS for peaty sand. To record the fibre content of peat use the upper case letters F for fibrous, M for semi-fibrous (mesic) and H for amorphous or humified peat, *e.g.* HP for amorphous peat.

Estimates of the unrubbed and rubbed fibre contents can be noted above and below the boxes respectively.

Do not tick the Hum ? box for organic materials.

- **Troels-Smith classification**

For a description of component elements of biogenic sediments a system devised by Troels-Smith (1955) is used. There are five main sediment categories:

Turfa ('peat', coarse fraction)
Detritus (median fraction)
Limnus (fine fraction)
Argilla (clay and silt)
Grana (sand and gravel)

Each is subdived into elements, as described in Table 2.

**Table 2. Scheme for the description of the composition of biogenic sediments (from Troels-Smith, 1955).**

| Class | Code | Element | Description |
|---|---|---|---|
| | Sh | Substantia humosa | Humous substance, homogeneous microscopic structure. |
| I Turfa | Tb $^{0-4}$ | T. bryophytica | Mosses +/- humous substance. |
| | Tl $^{0-4}$ | T. lignosa | Stumps, roots, intertwined rootlets, of ligneous plants +/- trunks, stems, branches, etc., connected with these, +/- humous substance. |
| | Th $^{0-4}$ | T. herbacea | Roots, intertwined rootlets, rhizomes, of herbaceous plants +/- stems, leaves, etc., connected with these, +/- humous substance. |
| II Detritus | Dl | D. lignosus | Fragments of ligneous plants >2 mm. |
| | Dh | D. herbosus | Fragments of herbaceous plants > 2 mm. |
| | Dg | D. granosus | Fragments of ligneous and herbaceous plants, and, sometimes, of animal fossils (except molluscs) < 2mm > c. 0.1 mm. |
| III Limus | Ld $^{0-4}$ | L. detrituosus | Plants and animals (except diatoms, needles of spongi, siliceous skeletons, etc., of organic origin), or fragments of these. Particles < c. 0.1 mm, +/- humous substance. |
| | Lso | L. siliceus organogenes | Diatoms, needles of spongi, siliceous skeletons, etc., of organic origin, or parts of these. Particles of < c. 0.1 mm. |
| | Lc | L. calcareus | Marl, not hardened like calcareous tufa; lime and the like. Particles < c. 0.1 mm. |
| | Lf | L. ferrugineus | Rust, non-hardened. Particles < c. 0.1 mm. |
| IV Argilla | As | A. steatodes | Particles of clay < 0.002 mm. |
| | Ag | A. granosa | Particles of clay 0.06 to 0.002 mm. |
| V Grana | Ga | G. arenosa | Mineral particles 0.6 to 0.2 mm. |
| | Gs | G. saburralia | Mineral particles 2.0 to 0.6 mm. |
| | Gg (min.) | G. glareosa minora | Mineral particles 6.0 to 2.0 mm |
| | Gg (maj.) | G. glareosa majora | Mineral particles 20.0 to 6.0 mm |

Relative abundance is recorded on a five-point scale:

0 absent
1 minor presence (1/4)
2 medium presence (2/4)
3 major presence (3/4)
4 sole presence (4/4)

A trace can be represented by '+'.

Enter the three-character codes (Table 2) in the Mottle 1 and Mottle 2 boxes. The codes must always add up to four, with a maximum of four codes or 12 boxes being used.

- **Peat type**

With Stone Abundance recorded as 0, the boxes for Stone Type may also be used for recording the peat type. Use the following upper case abbreviations entering the most common component first:

| **Peat-types** | | |
|---|---|---|
| Sphagnum | S | relatively pure *Sphagnum* peat |
| Hypnum | H | mainly hypnaceous moss peat |
| Polytrichum | P | mainly *Polytrichum* peat |
| Woody | W | contains relatively undecomposed wood remains |
| Ling | L | relatively pure *Calluna* peat |
| Eriophorum | E | relatively pure *Eriophorum* peat |
| Carex | C | relatively pure sedge peat |
| Molinia | M | mainly remains of *Molinia* |
| Grass | G | mainly remains of other grass species (*Nardus*, *Deschampsia flexuosa*, *etc*) |
| Reeds | R | mainly remains of *Phragmites* |

Intergrades can be catered for by the use of two letters, *e.g.* SE for Sphagnum Eriophorum peat.

Figure 3 is an example of an organic horizon fully described.

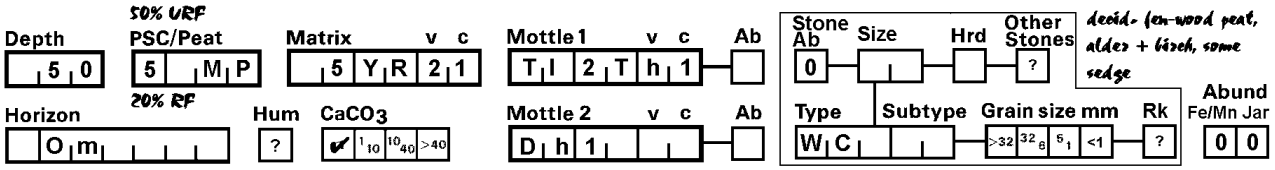



**Figure 3.** **A description of a semi-fibrous peat (MP) horizon extending to 50 cm depth.** The figure 5 indicates von Post class H5, moderately decomposed; there is a 50% unrubbed fibre content (URF) and 20% rubbed fibre content (RF); the Troels-Smith classification is 2 parts T.lignosa (Tl2), 1 part T.herbacea (Th1) and 1 part D.herbosus (Dh1); and the peat type classification is woody (W) with Carex (C).

## Control Section (for unknowns)

Not currently used

## REFERENCE

Hodgson, J.M. (1997) *Soil Survey Field Handbook.* Soil Survey Technical Monograph No. 5. Silsoe.

Troels-Smith, J, (1955) *Karakterisering af løse jordarter*. Geological Survey of Denmark, Copenhagen.

Prepared by

R.G.O. Burton, Senior Research Officer, 23 January 1998
24 November 1998

R.G.O. Burton, Retired 18 June 2009