Designation: D 4544 – 86 (Reapproved 2002)

Standard Practice for Estimating Peat Deposit Thickness[1]

This standard is issued under the fixed designation D 4544; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice uses a technique of probing to estimate the thickness of surficial peat deposits overlying mineral soil or bedrock. These estimates may be needed for energy, horticultural, or geotechnical purposes.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

1.3 *This practice offers a set of instructions for performing one or more specific operations. This document cannot replace education or experience and should be used in conjunction with professional judgment. Not all aspects of this practice may be applicable in all circumstances. This ASTM standard is not intended to represent or replace the standard of care by which the adequacy of a given professional service must be judged, nor should this document be applied without consideration of a project's many unique aspects. The word "Standard" in the title of this document means only that the document has been approved through the ASTM consensus process.*

2. Referenced Documents

2.1 *NRC Canada Document:*
Peat Testing Manual[2]

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *peat*—a naturally occurring organic substance derived primarily from plant materials.

4. Summary of Practice

4.1 The resistance to penetration of a pushed or driven rod will increase sharply at the boundary of a peat layer with underlying mineral soil or bedrock. When this abrupt change is measured in a series of probings with an appropriate spacing, the thickness and areal extent of peat can be defined and the volume of peat may be calculated.

4.2 Sampling of the peat may be required to determine the peat characteristics.

5. Significance and Use

5.1 This practice allows the determination of the depth at which the resistance to penetration of a pushed or driven rod increases sharply. When the overlying material is peat and the underlying one is mineral soil or bedrock, the depth of change may be interpreted as the thickness of peat. Successive areal determinations of this depth, in combination with surface measurements of the lateral extent of peat will allow calculation of the volume of peat in the deposit.

6. Interferences

6.1 Sampling of the zone of contact of peat with underlying material is usually necessary to verify the interpretations of material change from the rod penetration resistances.

6.2 Where the peat − mineral transition zone is of significant thickness, or where the peat is underlain by soft clays or marls, further sampling and testing will be required (see 7.2).

6.3 The frequency of sampling is highly dependent upon the physical details of the deposit.

6.4 Penetration of the rod may be prevented by wood pieces in the peat deposit. Data should be examined and rechecked if this occurrence is suspected.

6.5 The thin and flexible nature of the rod strings will limit the depths of penetrating and sampling.

7. Apparatus

7.1 *Graduated Steel Rods*—Penetration is achieved with graduated steel rods of 9.5 ± 1.0-mm diameter and 1.0 or 1.2-m length,[3] which can be threaded together to penetrate a range of thickness. The rods are ringed at 200-mm intervals for easy estimation of depth. A ring with a short threaded end is

[1] This practice is under the jurisdiction of ASTM Committee D18 on Soil and Rock and is the direct responsibility of Subcommittee D18.18 on Peats and Related Materials.

Current edition approved Feb. 21, 1986. Published April 1986.

[2] Available from the National Research Council of Canada, Publications Section, Building R-88, Ottawa, Ontario, Canada K1A OR6.

[3] For further information, see Jeglum, J. K., "Method for Measurement of Peat Thickness," *Peat Testing Manual*, Technical Memorandum No. 125, NRC Canada, May 1979, pp. 33–34.

screwed into the last section and another rod or stick inserted horizontally to facilitate pulling out the rod.

7.2 *Piston-Type Sampler*—Sampling is achieved, as necessary, with a piston-type or similar exploratory type sampler, the head of which is threaded into the bottom rod.[4]

8. Procedure

8.1 Align the rod vertically.

8.2 Penetrate the peat with the rod by pushing or driving. Add sections of rod as required.

8.3 Measure the thickness of peat when the resistance to penetration of the rod increases sharply owing to the resistance of the material underlying the peat. It may be possible to hear the scraping of the rod in the underlying soil, especially when it is sand.

8.4 Pull up the rod and seek verification of the resistance change by the presence of mineral material in the threads of the bottom rod.

8.5 Record the lateral position of the sounding.

8.6 Repeat steps 8.1-8.5 as necessary to define the thickness of the peat and its lateral extent.

8.7 At selected locations, attach the sampler and obtain peat and peat − mineral soil contact zone samples. When a piston-type sampler is attached to the bottom rod, the head is pushed down until resistance is met, the rod is pulled up until the central core catches at the end of the outer cylinder, and the open cylinder is then pushed a little further to obtain mineral material.

9. Report

9.1 The report shall include the following specific information:

9.1.1 Name and location of project; names of field party,

9.1.2 A map of the positions penetrated or sampled. Show surface elevations and water levels, where available,

9.1.3 A table of peat depths showing areal locations and noting whether depth was determined by penetration or sampling,

9.1.4 Descriptions of samples taken, along with locations,

9.1.5 Any test data run on samples taken, and

9.1.6 Appropriate description and classification of the peat in the deposit.

10. Keywords

10.1 deposit thickness; peat; probing

[4] This piston-type sampler and its use is described in *Muskeg Engineering Handbook*, I. C. MacFarlane, ed. Muskeg Subcommittee of the NRC Canada, 1969, pp. 144–145.