



Designation: D5753 – 18

Standard Guide for Planning and Conducting Geotechnical Borehole Geophysical Logging¹

This standard is issued under the fixed designation D5753; 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 Purpose and Application:

1.1.1 This guide covers the documentation and general procedures necessary to plan and conduct a geophysical borehole logging program as commonly applied to geologic, engineering, groundwater, and environmental (hereafter referred to as geotechnical) site characterizations.

1.1.2 This guide applies to commonly used logging methods (see **Tables 1 and 2**) for geotechnical site characterizations.

1.1.3 This guide provides an overview of the following:

- (1) the uses of single borehole geophysical methods,
- (2) general logging procedures,
- (3) documentation,
- (4) calibration, and
- (5) factors that can affect the quality of borehole geophysical logs and their subsequent interpretation. Log interpretation is very important, but specific methods are too diverse to be described in this guide.

1.1.4 Logging procedures must be adapted to meet the needs of a wide range of applications and stated in general terms so that flexibility or innovation are not suppressed.

1.1.5 To obtain detailed information on operating methods, publications (for example, **1, 2, 3, 4, 5, 6, 7, 8, and 9**)² should be consulted. A limited amount of tutorial information is provided, but other publications listed herein, including a glossary of terms and general texts on the subject, should be consulted for more complete background information.

1.2 Limitations:

¹ This guide is under the jurisdiction of ASTM Committee D18 on Soil and Rock and is the direct responsibility of Subcommittee D18.01 on Surface and Subsurface Characterization.

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² The boldface numbers in parentheses refer to a list of references at the end of this standard.

1.2.1 This guide is not meant to describe the specific or standard procedures for running each type of geophysical log, and is limited to measurements in a single borehole.

1.2.2 Surface or shallow-depth nuclear gages for measuring water content or soil density (that is, those typically thought of as construction quality assurance devices), measurements while drilling (MWD), cone penetrometer tests, and logging for petroleum or minerals are excluded.

1.2.3 *This guide offers an organized collection of information or a series of options and does not recommend a specific course of action. This document cannot replace education or experience and should be used in conjunction with professional judgment. Not all aspects of this guide 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.*

1.3 Precautions:

1.3.1 If the method is used at sites with hazardous materials, operations, or equipment, it is the responsibility of the user of this guide to establish appropriate safety and health practices, and to determine the applicability of regulations prior to use.

1.4 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

*A Summary of Changes section appears at the end of this standard