



Standard Test Methods for Individual Piles in Permafrost Under Static Axial Compressive Load¹

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INTRODUCTION

These test methods have been prepared to cover methods of axial load testing of piles in permafrost. The provisions permit the introduction of more detailed requirements and procedures when required to satisfy the objectives of the test program. The procedures herein produce a relationship between applied load and pile settlement for conditions of ground temperature at the time of test. The results may be interpreted to establish long-term load capacity of piles in permafrost.

1. Scope*

1.1 These test methods cover procedures for testing individual vertical piles to determine response of the pile to static compressive load applied axially to the pile. These test methods are applicable to all deep foundation units in permafrost that function in a manner similar to piles regardless of their method of installation. This standard is divided into the following sections:

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NOTE 1—Apparatus and procedures designated “optional” are to be required only when included in the project specifications or if not specified, may be used only with the approval of the engineer responsible for the foundation design. The word “shall” indicates a mandatory provision and “should” indicates a recommended or advisory provision. Imperative sentences indicate mandatory provisions. Notes, illustrations, and appendixes included herein are explanatory or advisory.

NOTE 2—This standard does not include the interpretation of test results or the application of test results to foundation design. See [Appendix X1](#) for comments regarding some of the factors influencing the interpretation

of test results. A qualified geotechnical engineer should interpret the test results for predicting pile performance and capacity.

1.2 Three different test methods are included within this standard. Method A is the standard method combining the results from loading two separate piles with the possibility of a third alternate pile. Method B is the alternate method combining the results from loading three separate piles with the possibility of a fourth alternate pile. Method C is a confirmation method requiring the testing of one pile with the possibility of a second alternate. Method C is applicable only where prior data are available.

1.3 All recorded and calculated values shall conform to the guide for significant digits and rounding established in Practice [D6026](#).

1.3.1 The procedures used to specify how data are collected/recorded and calculated in this standard are regarded as the industry standard. In addition, they are representative of the significant digits that should generally be retained. The procedures used do not consider material variation, purpose for obtaining the data, special purpose studies, or any considerations for the user’s objectives, and it is common practice to increase or reduce significant digits of reported data to be commensurate with these considerations. It is beyond the scope of this standard to consider significant digits used in analysis methods for engineering design.

1.3.2 Measurements made to more significant digits or better sensitivity than specified in this standard shall not be regarded a nonconformance with this standard.

1.4 The values stated in inch-pound units are to be regarded as the standard, except as noted below. The values given in parentheses are mathematical conversions to SI units, which are provided for information only and are not considered standard.

¹ This test method is under the jurisdiction of ASTM Committee [D18](#) on Soil and Rock and is the direct responsibility of Subcommittee [D18.19](#) on Frozen Soils and Rock.

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