



Designation: D7381 – 07 (Reapproved 2021)^{ε1}

Standard Practice for Establishing Allowable Stresses for Round Timbers for Piles from Tests of Full-Size Material¹

This standard is issued under the fixed designation D7381; 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.

^{ε1} NOTE—ASTM Specification E3200 and IEEE/ASTM SI-10 were added to the Referenced Documents section and editorial updates were made in Sections 3, 10.4 and 10.5 in December 2021.

1. Scope

1.1 This practice contains procedures for establishing allowable compression parallel to grain and bending stresses for round timbers used for piling, based on results from full-size tests.

NOTE 1—Allowable stresses for compression perpendicular to grain and shear properties are established in accordance with the provisions of Practice D2899.

1.2 Stresses established under this practice are applicable to piles conforming to the size, quality, straightness, spiral grain, knot, shake and split provisions of Specification D25.

1.3 A commentary on the practice is available from ASTM International.

1.4 The values stated in inch-pound units are to be regarded as standard. No other units of measurement are included in this standard.

1.5 *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.*

1.6 *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.*

2. Referenced Documents

2.1 ASTM Standards:²

¹ This practice is under the jurisdiction of ASTM Committee D07 on Wood and is the direct responsibility of Subcommittee D07.04 on Pole and Pile Products.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

D9 Terminology Relating to Wood and Wood-Based Products

D25 Specification for Round Timber Piles

D198 Test Methods of Static Tests of Lumber in Structural Sizes

D245 Practice for Establishing Structural Grades and Related Allowable Properties for Visually Graded Lumber

D1036 Test Methods of Static Tests of Wood Poles

D1990 Practice for Establishing Allowable Properties for Visually-Graded Dimension Lumber from In-Grade Tests of Full-Size Specimens

D2555 Practice for Establishing Clear Wood Strength Values

D2899 Practice for Establishing Allowable Stresses for Round Timber Piles

D2915 Practice for Sampling and Data-Analysis for Structural Wood and Wood-Based Products

D3200 Specification and Test Method for Establishing Recommended Design Stresses for Round Timber Construction Poles

D4761 Test Methods for Mechanical Properties of Lumber and Wood-Based Structural Materials

D6555 Guide for Evaluating System Effects in Repetitive-Member Wood Assemblies

IEEE/ASTM SI-10 American National Standard for Metric Practice

3. Terminology

3.1 Definitions:

3.1.1 For definitions of terms used in this standard, refer to Terminology D9.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *allowable stress*—numeric value of pile strength appropriate for use in design.

3.2.2 *end-bearing*—compression parallel to grain stress used in design when the pile load is not carried to the soil through skin friction.

3.2.3 *load sharing*—distribution of load that occurs in two or more piles which are capped with a load-distributing element that assures the piles deform as a group.

3.2.3.1 *Discussion*—The load distributed to the piles in such