ANSI O5.4-2017

Naturally Durable Hardwood Poles: Specifications and Dimensions

AMERICAN NATIONAL STANDARD FOR WOOD UTILITY PRODUCTS

Accredited Standards Committee O5 was first organized in 1924 by the Bell Telephone System and the U.S. Independent Telephone Association's American Standards Association (ASA) Telephone Group. The Exchange Carrier Standards Association (ECSA), which later became the Alliance for Telecommunications Industry Solutions (ATIS), accepted sponsorship and Secretariat responsibility for ASC O5 in 1985. The American Wood Protection Association (AWPA) then assumed the role of Secretariat, effective January 1, 2011. ASC O5 is jointly accredited with its Secretariat by the American National Standards Institute. This committee develops standards for wood poles, crossarms, braces, and glue laminated timber for utility structures. For more information, visit the ASC O5 website at **www.asco5.org**.

Founded in 1904, the American Wood Protection Association (AWPA) is a non-profit organization that promulgates voluntary standards for technologies which protect wood from degradation. AWPA Standards are developed by its technical committees in an open, consensus-based process that involves individuals from all facets of wood preservation: Producers of preservatives and preservative components; producers of treated and untreated wood products; end users of treated wood; engineers, architects and building code officials; government entities, academia, and other groups with a general interest in wood preservation. AWPA's Standards are universally specified for wood protection in the USA, and are recognized worldwide. For more information visit the AWPA website at **www.awpa.com**.

AMERICAN NATIONAL STANDARD

Approval of an American National Standard requires review by ANSI that the requirements for due process, consensus, and other criteria for approval have been met by the standards developer.

Consensus is established when, in the judgment of the ANSI Board of Standards Review, substantial agreement has been reached by directly and materially affected interests. Substantial agreement means much more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that a concerted effort be made towards their resolution.

The use of American National Standards is completely voluntary; their existence does not in any respect preclude anyone, whether he has approved the standards or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standards.

The American National Standards Institute does not develop standards and will in no circumstances give an interpretation of any American National Standard. Moreover, no person shall have the right or authority to issue an interpretation of an American National Standard in the name of the American National Standards Institute. Requests for interpretations should be addressed to the secretariat or sponsor whose name appears on the title page of this standard.

CAUTION NOTICE: This American National Standard may be revised or withdrawn at any time. The procedures of the American National Standards Institute require that action be taken periodically to reaffirm, revise, or withdraw this standard. Purchasers of American National Standards may receive current information on all standards by calling or writing the American National Standards Institute.

Notice of Disclaimer & Limitation of Liability: The information provided in this document is directed solely to professionals who have the appropriate degree of experience to understand and interpret its contents in accordance with generally accepted engineering or other professional standards and applicable regulations. No recommendation as to products or vendors is made or should be implied.

NO REPRESENTATION OR WARRANTY IS MADE THAT THE INFORMATION IS TECHNICALLY ACCURATE OR SUFFICIENT OR CONFORMS TO ANY STATUTE, GOVERNMENTAL RULE OR REGULATION, AND FURTHER, NO REPRESENTATION OR WARRANTY IS MADE OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OR AGAINST INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS. AWPA SHALL NOT BE LIABLE, BEYOND THE AMOUNT OF ANY SUM RECEIVED AS PAYMENT FOR THIS DOCUMENT, WITH RESPECT TO ANY CLAIM, AND IN NO EVENT SHALL AWPA BE LIABLE FOR LOST PROFITS OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES. AWPA EXPRESSLY ADVISES ANY AND ALL USE OF OR RELIANCE UPON THIS INFORMATION PROVIDED IN THIS DOCUMENT IS AT THE RISK OF THE USER.

NOTE - The user's attention is called to the possibility that compliance with this standard may require use of an invention covered by patent rights. By publication of this standard, no position is taken with respect to whether use of an invention covered by patent rights will be required, and if any such use is required no position is taken regarding the validity of this claim or any patent rights in connection therewith.

ANSI O5.4-2017, Naturally Durable Hardwood Poles: Specifications and Dimensions

is an American National Standard developed by **ASC O5 – Wood Utility Products.**

Published by
American Wood Protection Association
P.O. Box 36174
Birmingham, AL 35236

Printed in the United States of America.

ANSI O5.4.2017

American National Standard for Wood Utility Products

Naturally Durable Hardwood Poles: Specifications and Dimensions

Secretariat
American Wood Protection Association, Inc.

Approved February 23, 2017
American National Standards Institute, Inc.

Foreword

Consists of specification and dimensions for Naturally Durable Hardwoods for utility wood poles. These wood species do not require preservative treatment for field use. The poles described are considered as simple cantilever members subject to transversal loads only.

This standard was developed by Accredited Standards Committee O5 – Wood Utility Products (ASC O5) under the procedural administration of the American Wood Protection Association (AWPA). ASC O5 was organized in December 1924 and has produced revisions of this standard from time to time as required or deemed beneficial. This standard supersedes American National Standard ANSI O5.4-2009.

Suggestions for improvement of this standard will be welcomed. They should be sent to ASC O5 through its Secretariat: American Wood Protection Association, P.O. Box 361784, Birmingham, AL 35236 <www.awpa.com>.

This standard was processed and approved for submittal to ANSI by ASC O5. Committee approval of this standard does not necessarily imply that all committee members voted for its approval. At the time it processed and approved this standard, ASC O5 had the following leadership and members:

Nelson. Bingel, ASC O5 Chair
Brian Flynn, ASC O5 Vice-Chair
Colin McCown, ASC O5 Executive Secretary and Editor

Organization Represented	Name of Representative
A.W Williams Inspection Company	Edward Williams, Jr.
Alabama Power Company	Alan Blankenship
Alamco Wood Products, LLC	Kris Pierce
American Transmission Company	Justin Kavanaugh Bob Kluge (Alt.)
APA – The Engineered Wood Association	B.J. Yeh
Arch Wood Protection	Tim Carey Will Cox (Alt.)
Bell Lumber & Pole Company	Jim Fixsen Brett Franks (Alt.)
Brooks Manufacturing Company	Shannon Terrell Dwayne Carter (Alt.)
CenturyLink	Brian Penrose Mike Fargano (Alt.)
ComEd	David D'Hooge
Cox Industries	Jim Healey Byron Altman (Alt.)
Dis-Tran Overhead Solutions, LLC	Pat Bordelon Tony Loken (Alt.)
EDM International	Rob Nelson Andy Stewart (Alt.)
Hughes Brothers, Inc.	Larry Vandergriend
Intec Services, Inc.	Andy Kudick
Laminated Wood Systems, Inc.	Bob Reisdorff
Langdale Forest Products Company	Jim Hickman Eric Nall (Alt.)
McFarland Cascade, A Stella-Jones Co.	Kyle Cassidy Bob Baeppler (Alt.)
McIntyre Associates, Inc.	Craig McIntyre
Minnesota Power	Reed Rosandich
Mississippi State University	Mike Barnes
National Rural Electric Cooperatives Association	Jim Carter Nick Klein (Alt.)

Organization Represented	Name of Representative
North American Wood Pole Council	Martin Rollins Kevin Ragon (Alt.)
Oregon State University	Jeff Morrell
Osmose Utilities Services, Inc.	Nelson Bingel
Outside Plant Consulting Services, Inc.	Larry Slavin
Power Line Systems, Inc.	Otto Lynch Brandon Grillon (Alt.)
Public Service New Mexico	Norm Sedillo
Rogers International Consulting, Inc.	J.R. Gonzalez Michael Marohn (Alt.)
Rural Utilities Service (USDA)	Wilson Johnson Norris Nicholson (Alt.)
Southern California Edison	Brian Flynn Michael Hansen (Alt.)
Southern Pressure Treaters Association	Joey Wheat Phil Myers (Alt.)
State University of New York	Bill Smith Bob Meyer (Alt.)
TB Consulting, LLC	Todd Brown
T.R. Miller Mill Company	Ron Cauley
Telcordia (Ericsson)	Trevor Bowmer
Texas Electric Cooperatives	Carlton Penney
Thomasson Company	Randy Deweese Brent Gray (Alt.)
Timber Products Inspection	Mike Dilbeck
University of Minnesota	Jerry Winandy
VPC Energy, Inc.	Art Peralta
Western Area Power Administration	Gerald Paulson Karen Rowe (Alt.)
Western Wood Preservers Institute	Robert West Dallin Brooks (Alt.)
Wood Preservation Canada	Henry Walthert Craig Frohlich (Alt.)

Table of Contents

Table of Figures

Table of Tables

American National Standard for Wood Poles and Wood Products --

Naturally Durable Hardwood Poles – Specifications & Dimensions

1 Scope and general requirements

1.1 Scope

This Standard provides minimum specifications for the quality and dimensions of naturally durable hardwood poles without preservative treatment to be used in single-pole utility structures. The poles described herein are considered as simple cantilever members subject to transverse loads only. Fiber strength values, provided as a basis for determining pole class sizes, apply only to poles that meet or exceed the minimum quality specifications. The pole class size tables for each fiber strength value for the naturally durable hardwood species represent their heartwood circumferences unless the sapwood also possesses high natural durability. These fiber strengths may be used to estimate the average groundline moment capacity of the naturally durable hardwood poles.

Only poles that meet the naturally durable hardwood species criteria established in this Standard will be allowed to be listed as an approved naturally durable hardwood pole.

1.2 Natural durability

The heartwood of all naturally durable hardwood poles listed in this Standard shall be tested in accordance with ASTM D2017 - 05 and have an Indicated Class of Resistance of “Highly Resistant” for all applicable test fungi. The sapwood shall have an indicated Class of Resistance of “resistant” or higher according to ASTM D2017-05. Sapwood does not need to be rated as “Highly Resistant”, and if it is not, pole dimensions are based on heartwood measurements alone[1]. Sapwood tested and rated as “Highly Resistant” will be included in the determination of pole dimensions as described in section 4 of this Standard.

> NOTE: This Standard does not purport to establish the durability or Indicated Class Resistance of any particular species listed herein. The users of this Standard shall review all pertinent data and make their own determination as to the appropriateness of the natural durability of a particular species for the user’s application.

1.3 Moisture content (MC)

The natural durable hardwoods must have reached 20% MC or less at the heartwood/sapwood boundary, measured with a moisture meter before shipping. This requirement is intended to eliminate or reduce the potential splits caused by severe drying. Also, the pole classes in this Standard are determined in the dry state (< 20% MC) (see Dimension Tables below).

1.4 Shrinkage

The naturally durable hardwoods dimension presented in this Standard have been adjusted to accommodate for permanent shrinkage of the naturally durable hardwood poles. The shrinkage amount will vary somewhat from species to species. For the purposes of this Standard, 5% shrinkage is used in deriving the required pole dimensions.

1.5 General requirements

All naturally durable hardwoods shall originate from managed forests with sustainable forest management practices and shall be certified by an agency or third party acceptable to the end user as a sustainably managed forest. Examples of such certifying organizations include; Sustainable Forestry Initiative® (SFI), Forest Stewardship Council® (FSC); Sistema Brazileiro de Certificação Florestal (CERFLOR); as well as others.

---

[1] Refer to section 4 of this standard to determine dimension methodology for heartwood.