



ANSI O5.2-2020

**Structural Glued Laminated
Timber for Utility Structures**

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 USERS NOT TO RELY 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 O5.2-2020, Structural Glued Laminated Timber for Utility Structures

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

Published by
American Wood Protection Association
P.O. Box 36004
Birmingham, AL 35236

Copyright © 2020 by American Wood Protection Association. All rights reserved.

No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without the prior written permission of the publisher. For information contact AWPA at 205.773.4077. AWPA is online at www.awpa.com.

Printed in the United States of America.

ANSI O5.2-2020

American National Standard for Wood Products

**Structural Glued Laminated Timber
for Utility Structures**

Secretariat
American Wood Protection Association, Inc.

Approved January 10, 2020
American National Standards Institute, Inc.

ANSI O5.2-2020

Foreword

This American National Standard establishes requirements for structural glued laminated timber utility structures and provides a basis for common understanding among producers, distributors, and users of this product. This standard references specific material grading rules and processing routines, the criteria of which are uniform and fair to enable a standardization of the end product.

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 contains three annexes. These are provided for information only, and are not considered part of this standard.

Suggestions for improvement of this standard will be welcomed. They should be sent to ASC O5 through its Secretary: 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, Chair
 Brian Flynn, Vice Chair
 Colin McCown, Executive Secretary and Editor

Organization Represented	Name of Representative
A.W Williams Inspection Company	Edward Williams, Jr. Edward Morrisette. (Alt.)
Alabama Power Company	Alan Blankenship
Alamco Wood Products, LLC	Kris Pierce
American Transmission Company	Justin Kavanaugh
APA – The Engineered Wood Association	B.J. Yeh
Bell Lumber & Pole Company	Jim Fixsen Brett Franks (Alt.)
Brooks Manufacturing Company	Shannon Terrell Curt Aylen (Alt.)
Bunya Telecom	Trevor Bowmer
ComEd	David D'Hooge
Cox Industries	Jim Healey Byron Altman (Alt.)
Dis-Tran Overhead Solutions, LLC	Pat Bordelon
EDM International	Rob Nelson Andy Stewart (Alt.)
Hughes Brothers, Inc.	Larry Vandenberg
Intec Services, Inc.	Andy Kudick
Laminated Wood Systems, Inc.	Bob Reisdorff
Langdale Forest Products Company	Jim Hickman
McFarland Cascade, A Stella-Jones Company	Mike Cassidy
McIntyre Associates, Inc.	Craig McIntyre
Minnesota Power	Reed Rosandich
Mississippi State University	Mike Barnes
National Centre for Timber Durability & Design Life	Jeff Morrell
National Rural Electric Cooperatives Association	James Carter Nick Klein (Alt.)
Nelson Research	Nelson Bingel
Northern American Wood Pole Council	Martin Rollins Kevin Ragon (Alt.)

Organization Represented	Name of Representative
Oncor Electric Delivery	Rick Hausmann Byron Hairston (Alt.)
Oregon State University	Arijit Sinha Jed Cappellazzi (Alt.)
Osmose Utilities Services, Inc.	Chad Newton Tom Pope (Alt.)
Outside Plant Consulting Services, Inc.	Larry Slavin
Power Line Systems, Inc.	Otto Lynch Brandon Grillon (Alt.)
Public Service New Mexico	Norm Sedillo
Rural Utilities Service	Chendi Zhang Trung Hiu
Southern California Edison	Brian Flynn Michael Hansen (Alt.)
Southern Pressure Treaters Association	Davy Vines David Stanley, Jr. (Alt.)
State University of New York	Bill Smith Bob Meyer (Alt.)
T.R. Miller Mill Company	Ron Cauley
TB Consulting	Todd Brown
Thomasson Company	Randy Deweese Brent Gray (Alt.)
Timber Products Inspection	Mike Dilbeck Jeremy Williams (Alt.)
TLine Engineering, Inc.	Vahid Zakeri
University of Minnesota	Jerry Winandy
Viance, LLC	Bob Baeppler Kevin Archer (Alt.)
VPC Energy, Inc.	Art Peralta
Western Area Power Administration	Karen Rowe Rebecca Afsar (Alt.)
Western Wood Preservers Institute	Eric Pitner Butch Bernhardt (Alt.)
Wood Preservation Canada	Martin Tauvette Craig Frohlich (Alt.)

Table of Contents

1 Scope 1

2 Normative references 1

3 Definitions 2

4 Material requirements 3

5 Manufacturing requirements 6

6 Marking and coding 8

7 Testing and inspection 9

8 Quality control system 9

9 Storage and shipping 9

Annex A Spike knots 10

Annex B Adjusting test results to obtain fiber stress 12

Annex C Test setup for evaluation of crossarm bending MOR 13

Table of Figures

Figure A.1 – Acceptable dimensions for spike knots 11

Figure A.2 – Acceptable dimensions for larger spike knots 11

Figure C – Test setup for evaluation of crossarm bending MOR 13

Table of Tables

Table 1 - Moisture content range 5

Table 2 – Loading condition coefficient (KL) 6

Table 3 – Stress adjustment factor ‘K’ 6

Table B.1 – Factors for determining fiber stress values 12

American National Standard for Wood Utility Products – Structural Glued Laminated Timber for Utility Structures

1 Scope

This standard covers requirements for manufacturing and quality control of structural glued laminated timber of Southern Pine (longleaf, slash, shortleaf, loblolly), Coast Douglas-fir, Hem-Fir and other species of similar treatability for electric power and communication structures. The requirements are based on those in *American National Standard for Structural Glued Laminated Timber*, ANSI A190.1. This standard is supplemental to ANSI A190.1 and provides descriptions of the special manufacturing and design requirements for glued laminated utility structures.

The term, *structural glued laminated timber*, as used in this standard, refers to an engineered, stress-rated product of a timber laminating plant comprising assemblies of specially selected and prepared wood laminations securely bonded together with adhesives. The grain of all laminations is approximately parallel longitudinally. They may comprise pieces end joined to form any length, or pieces placed or glued edge-to-edge to make wider ones or of pieces bent to curved form during gluing.

Timbers manufactured in accordance with this standard can be stressed in axial tension or axial compression, loaded in bending parallel to or perpendicular to the wide face of the laminations, or any combination of the above. Members that are normally loaded in bending about one axis of the laminated timber may, under other loading conditions, be stressed about the other axis, or about both axes and shall be designed accordingly. See *Standard Specifications for Structural Glued Laminated Timber of Softwood Species*, ANSI 117, for descriptions of various arrangements of laminations within a laminated member. Other combinations of grades of lumber are available that may be more desirable and economical, depending upon the design and loading requirements of the timber and availability of various grades.

All timbers produced in accordance with the requirements of this standard are intended for use in exterior construction and, therefore, will be exposed to both wet and dry conditions of use.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this American National Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this American National Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. The latest edition (unless a specific edition is referenced) may be used as references.

AITC 111-2005, *Recommendation practice for protection of structural glued laminated timber during transit, storage and erection*¹

AITC 200-2009, *Manufacturing Quality Control Systems Manual*¹

AITC 2004, *Technical Note 18, Evaluation of Checking in Glued Laminated Timber*¹

ANSI 117-2013, *Standard specifications for structural glued laminated timber of soft wood species*²

ANSI A190.1-2017, *Wood products – Structural glued laminated timber*²

APA-R540-2013, *Builder tips, proper storage and handling of glulam beams*²

APA Technical Note R475-2007, *Evaluation of Check in Glued Laminated Timber Beams*²

¹ Available from the American Institute of Timber Construction, www.aitc-glulam.org

² Available from the APA, The Engineered Wood Association, www.apawood.org