This is a preview of "ANSI O5.1-2008". Click here to purchase the full version from the ANSI store.



O5.1.2008

# WOOD POLES – SPECIFICATIONS & DIMENSIONS

AMERICAN NATIONAL STANDARD



Founded in 1904, the American Wood Protection Association (AWPA) is a non-profit organization which is responsible for promulgating voluntary wood preservation standards. 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 preservation in the USA, and are recognized worldwide.

AWPA standards help ensure that treated wood products perform satisfactorily for their intended use. They are recognized and used by most, if not all, specifiers of treated wood including electrical utility, marine, road and building construction as well as by local, state and federal governments. For more information visit <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. ATIS SHALL NOT BE LIABLE, BEYOND THE AMOUNT OF ANY SUM RECEIVED IN PAYMENT BY ATIS FOR THIS DOCUMENT, WITH RESPECT TO ANY CLAIM, AND IN NO EVENT SHALL ATIS BE LIABLE FOR LOST PROFITS OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES. ATIS 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.

## O5.1.2008, Wood Poles - Specifications and Dimensions

Is an American National Standard developed by the ASC O5 - Wood Poles and Wood Products.

Published by

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

Copyright © 2011 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 < http://www.awpa.com>.

Printed in the United States of America.

This is a preview of "ANSI O5.1-2008". Click here to purchase the full version from the ANSI store.

**ANSI O5.1.2008** 

(includes ANSI O5.1.a.2008)

American National Standard for Wood Poles and Wood Products

# WOOD POLES – SPECIFICATIONS & DIMENSIONS

Secretariat

**American Wood Protection Association** 

Approved September, 2008

American National Standards Institute, Inc.

### **Abstract**

Consists of specifications and dimensions for wood utility poles that are to be given preservative treatment as specified by the purchaser. The poles described are considered as simple cantilever members subject to transverse loads only. Requirements for the preservative treatment of poles are not included although the effects of conditioning are accounted for.

#### ANSI O5.1.2008

## **FOREWORD**

The information contained in this Foreword is not part of this American National Standard (ANS) and has not been processed in accordance with the American National Standards Institute's (ANSI's) requirements for an ANS. As such, this Foreword may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the standard.

This standard was developed by Accredited Standards Committee O5 on Specifications for Wood Poles (ASC O5) under the sponsorship of the American Wood Protection Association (AWPA). This committee was organized in December 1924 and has produced revisions of this pole specification from time to time as required or deemed beneficial. This standard supersedes American National Standard O5.1-2002.

Suggestions for improvement of this standard will be welcome. They should be sent to ASC O5 Secretariat, c/o AWPA P.O. Box 361784 Birmingham AL 35236 <a href="https://www.awpa.com">www.awpa.com</a>.

This standard was processed and approved for submittal to ANSI by Accredited Standards Committee O5 on Specifications for Wood Poles. Committee approval of the standard does not necessarily imply that all committee members voted for its approval.

At the time it processed and approved this standard, the ASC O5 had the following members:

N. Bingel, ASC O5 Chair

C. McCown, ASC O5 Vice-Chair

S. Barclay and J.P. Emard, ATIS Secretariat and Editors

C. Underkoffler, ATIS Chief Editor

N. Bingel, ASC O5 Technical Editor

J. Wheat, ASC O5 Technical Editor

Name of Representative	Organization Represented
E.D. Williams	A.W. Williams Inspection Co., Inc.
Edward D. Williams Jr.	A.W. Williams Inspection Co., Inc.
Jeffrey D. Linville	American Institute of Timber Construction
R. Michael Caldwell, P.E.	American Institute of Timber Construction
Ron Goff, P.E.	American Institute of Timber Construction
Dean Matthews	American Wood Preservers Institute
Mike Dilbeck	American Wood Protection Association
Les Lonning	American Wood Protection Association
Colin McCown	American Wood Protection Association
Robert C. Patterson, P.E.	American Wood Protection Association
Craig McIntyre	American Wood Protection Association
James J. Healey	American Wood Protection Institution
Borjen Yeh	APA - The Engineered Wood Association
Shannon Terrell	Brooks Manufacturing Co.
Dwayne Carter	Brooks Manufacturing Co.
Gouri Bhuyan, Ph.D.	Canadian Electricity Association
Mary Joe Rodgers	Comcast
JR Gonzales	Comcast
Dave D'Hooge	Edison Electrical Institute
Randy Hopkins	Edison Electrical Institute
Reed Rosandich, P.E.	Edison Electrical Institute
Rob Nelson	EDM International
Lee R. Gjovik	Gjovik Consulting, Inc.
Nelson G. Bingel, III	IEEE
Robert O. Kluge	IEEE
Robert C. Peters	IEEE
Andrew Kudick	Intec Services
Robert A. Reisdorff	Laminated Wood Systems, Inc.

Name of Representative	Organization Represented
H. Michael Barnes	Mississippi Forest Production Lab
H. Martin Rollins	North American Wood Pole Council
James Carter	National Rural Electric Coop Association
Nick Klein	National Rural Electric Coop Association
Bill Latunen	North West Pole & Piling Shippers Association
Jeffrey J. Morrell	Oregon State University
Larry Slavin	Outside Plant Consulting Services
Todd Brown	Rocky Mountain Pole and Treating Association
H. Robert Lash	Rural Utilities Services
Vahid Zakeri	San Diego Gas & Electric
Arthur D. Peralta	Southern California Edison
Robby S. Brown	Southern Pine Inspection Bureau
Ron Cauley	Southern Pressure Treaters Association
Hollis Ervin	Southern Pressure Treaters Association
Joseph Wheat	Southern Pressure Treaters Association
Robert Meyer	State University of New York – Forestry – Syracuse
Trevor Bowmer	Telcordia Technologies
Donald A. Devisser	West Coast Lumber Inspection Bureau
Gerald Paulson	Western Area Power Administration
Karen Rowe	Western Area Power Administration
Tim Durbin	Western Red Cedar Pole Association
Steve Kracht	Western Red Cedar Pole Association
Randy Baileys	Western Wood Preservers Institute
Stephen F. Smith	Western Wood Preservers Institute
Craig Fohlich	Wood Preservation Canada
Henry Walthert	Wood Preservation Canada

## ANSI O5.1.2008

# TABLE OF CONTENTS

1	SCOPE & GENERAL REQUIREMENTS						
	1.1	SCOPE					
	1.2	GENERAL REQUIREMENTS					
2	NOR	RMATIVE REFERENCES	1				
_							
3	DEF	INITIONS	2				
4	POL	E CLASSES	4				
5	MAT	TERIAL REQUIREMENTS					
	5.1	GENERAL					
	5.1.1 5.1.2						
	5.1.2						
	5.1.2						
	5.1.2						
	5.1.2	.4 Kiln drying	4				
	5.1.2	2.5 Steaming (Douglas-fir & western larch)	6				
	5.1.2	.6 Sterilization	6				
	5.1.3						
	5.1.4	7.6					
	5.2	PROHIBITED DEFECTS.					
	5.3 5.3.1	PERMITTED DEFECTS					
	5.3.1 5.3.2						
	5.3.3						
	5.3.4						
	5.4	LIMITED DEFECTS					
	5.4.1						
	5.4.2	- · · ·					
	5.4.3						
	5.4.4	J					
	5.4.5	8					
	5.4.6						
	5.4.7 5.4.8						
	5.4.9						
	5.4.1						
	5.4.1						
	5.4.1	1.1 In the top	9				
		1.2 In the butt					
		2 Shelling					
	5.4.1	3 Cone Holes	9				
6	DIM	ENSIONS	1(				
	6.1	Length	17				
	6.2	CIRCUMFERENCE					
	6.2.1						
	6.2.2						
	6.3	CLASSIFICATION					
_							
7	MAI	NUFACTURING REQUIREMENTS					
	7.1	BARK REMOVAL	10				
	7.2	SAWING					
	7.3	TRIMMING					
	7.4	SHAVING					
	7.5	Marking & code letters	11				
8	STORAGE & HANDLING1						
	Q 1	Storage	10				
	8.1 8.2	STORAGE					
	J.2	TET TO DELIGE	1.				

## ANSI O5.1.2008

	8.3	MECHANICAL DAMAGE	13
A	DESI	GN PRACTICE	33
	A 1 D	OLES NOT INCLUDED IN THE SIZE STUDY	33
	A.1 I	OUTHERN PINE, DOUGLAS-FIR, & WESTERN RED CEDAR.	34
		Multi-pole Structures	
В	CR	OUNDLINE STRESSES	30
,	O.N		37
$\mathbf{C}$	RE	LIABILITY BASED DESIGN	41
	C.1	SCOPE	41
	C.2	POLE CLASSES & GEOMETRY	
	C.3	ADJUSTMENTS TO SPECIAL CONDITIONS	
	C.4	GENERATION OF MATERIAL RESISTANCE DATA	43
D	RE	QUIREMENTS FOR CONSIDERATION OF FOREIGN SPECIES INTO ANSI 05.1.2008	47
	D.1	SCOPE	
	D.1 D.2	REQUIREMENTS	
_			
E	BH	BLIOGRAPHY	49
F	<b>A.</b> C	CRONYMS & ABBREVIATIONS	50
	AC	ACTURE & ADDREVIATIONS	50
_		P	
		OF FIGURES	
Fi	GURE 1	- MEASUREMENT OF SWEEP AND SHORT CROOK IN POLES	32
T.	V DI E	OF TABLES	
T.	ADLE	DESIGNATED FIBER STRENGTH FOR WOOD UTILITY POLES <sup>1)</sup>	1.4
		LIMITS OF KNOT SIZES	
TA	ABLE 3 -	DIMENSIONS OF NORTHERN WHITE CEDAR POLES (FIBER STRENGTH 4000 PSI)	16
		(INTENTIONALLY LEFT BLANK)	
		DIMENSIONS OF WESTERN RED CEDAR AND PONDEROSA PINE POLES (FIBER STRENGTH 6000 PSI)	
TA	ABLE 7 -	DIMENSIONS OF ALASKA YELLOW CEDAR POLES (FIBER STRENGTH 7400 PSI)	24
		DIMENSIONS OF DOUGLAS-FIR (BOTH TYPES) AND SOUTHERN PINE POLES (FIBER STRENGTH 8000 PSI)	
TΔ	ABLE 9 -	DIMENSIONS OF WESTERN LARCH POLES (FIBER STRENGTH 8400 PSI)	28
1.7	וייייייייייייייייייייייייייייייייייייי	CIDENTIFICATION OF SECTION (SCHIDING TIME) TOLLS (TIDENTIFICATION TOLD)	50
_			
		1 - METRIC DIMENSIONS OF NORTHERN WHITE CEDAR POLES (FIBER STRENGTH 27.6 MPA)	
		1 - METRIC DIMENSIONS OF WESTERN RED CEDAR <sup>1)</sup> AND PONDEROSA PINE POLES (FIBER STRENGTH 41.4 MPA)	
TA	ABLE 6M	$f I$ - METRIC DIMENSIONS OF JACK PINE, LODGEPOLE, RED PINE, WESTERN FIR, AND RADIATA PINE $^2$ (FIBER STRENGTH $f 45.5$ MPA)	23
		I - METRIC DIMENSIONS OF ALASKA YELLOW CEDAR POLES (FIBER STRENGTH 51.0 MPA)	
		I - METRIC DIMENSIONS OF DOUGLAS-FIR (BOTH TYPES) AND SOUTHERN PINE POLES (FIBER STRENGTH 55.2 MPA)	
TA	ABLE 9101	I - METRIC DIMENSIONS OF WESTERN LARCH POLES (FIBER STRENGTH 57.9 MPA)	29
	10111111	(1.12.11.0.11.0.10.11.0.11.11.11.11.11.11.11.	
T	DYE A 1	1. Doving the Fig. 4 pours Charles (mappings). Et croppe pop lies the Attribute sto Fourthean A.A.	27
TΔ	ABLE A.I	1 - DOUGLAS-FIR ABOVE-GROUND STRENGTH FACTORS FOR USE AS ALTERNATIVES TO EQUATION A.2 <sup>1</sup>	37
TA	ABLE A.3	2 - SOUTHERN PINE ABOVE-GROUND STRENGTH PACTORS FOR USE AS ALTERNATIVES TO EQUATION A.2	38
Т^	NRI E C 1	1 - GROUNDLINE STRENGTH AND STIFFNESS VALUES FOR NEW, GREEN POLES LESS THAN 50 FEET (15.2M) LONG <sup>1),2)</sup>	11
TA	ABLE C.2	2 - Groundline strength and stiffness values for new, green poles, $50$ feet ( $15.2$ m) and longer, used in unguyed, since	GLE-
	POL	E STRUCTURES ONLY <sup>1), 2)</sup>	45
TA	ABLE C.3	3 - GROUNDLINE STRENGTH AND STIFFNESS VALUES FOR NEW, GREEN POLES, 50 FEET (15.2M) AND LONGER, USED IN STRUCTURES C AN UNGUYED SINGLE-POLE STRUCTURES <sup>1), 2)</sup>	THER
TA	ABLE C.	4 - CORRECTION FACTORS FOR POLE STRENGTH AND STIFFNESS (K <sub>I</sub> FACTORS FOR EQUATIONS 2 AND 3)	46
		5 - HEIGHT-EFFECT CORRECTION FACTORS FOR MOR	

#### AMERICAN NATIONAL STANDARD

O5.1.2008

American National Standard for Wood Poles and Wood Products –

## **Specifications & Dimensions**

### 1 SCOPE & GENERAL REQUIREMENTS

## 1.1 Scope

This standard provides minimum specifications for the quality and dimensions of wood poles that are to be used as 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.

Requirements for the preservative treatment of poles are outside the scope of this standard. However, where such treatment or conditioning may affect strength, limitations are provided in section 5.1.2. [See also standards such as those published by American Wood Protection Association (AWPA) and ASTM].

## 1.2 General requirements

The species, the length, and class of poles; the type of treatment (including seasoning details, if seasoning is desired); aids to penetration such as incising, groundline boring, or kerfing; and complete details for roofing, gaining, boring, and branding not included in this standard shall be given in purchase orders.

Complete detailed instructions shall be given to the supplier whenever the requirements of this standard are modified to meet special conditions.

## 2 NORMATIVE REFERENCES

The standards listed below 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, therefore users of this standard are encouraged to investigate the possibility of applying the most recent editions of the standards.

ASC-C2-2007, National electrical safety code.<sup>1</sup>

AWPA Standard M6-07, Brands used on forest products.<sup>2</sup>

ASTM D9-05, Standard terminology relating to wood.3

Wood Preservation Statistics, Forest Service, U.S. Department of Agriculture, 1973.4

1

<sup>&</sup>lt;sup>1</sup> Available from < <a href="http://shop.ieee.org/store">http://shop.ieee.org/store</a> >.

<sup>&</sup>lt;sup>2</sup> Available from < <a href="http://www.awpa.com">http://www.awpa.com">http://www.awpa.com</a> >.

<sup>&</sup>lt;sup>3</sup> Available from < <a href="http://www.astm.org">http://www.astm.org</a> >.