



SECTION 1050

LUMBER, TIMBER, PILING, POSTS AND POLES

1050.1 Scope. This specification covers wood products as defined in the AWWA Standards.

1050.2 Posts.

1050.2.1 Posts and Blocks for Guardrail. Posts and blocks for guardrail shall be rectangular, standard rough sawn and of the size and length shown on the plans. Posts and blocks shall be Douglas Fir or Southern Pine and pressure treated as shown in Table I. Other preservatives and wood species shall be in accordance with applicable AWWA Standards. All framing and boring shall be completed before treatment. Douglas Fir shall be "Dense No. 1 Structural Grade" in accordance with Paragraph 131-bb of the current *Standard Grading Rules for West Coast Lumber*. Southern Pine shall be "No. 1 SR Grade" in accordance with Paragraph 406 of the current *Standard Grading Rules for Southern Pine Lumber*.

1050.2.2 Posts for Fence. Posts for fence shall be round and of the sizes and lengths shown on the plans. Posts shall be pressure-treated as shown in Table I for the noted species. Other preservatives and wood species shall be in accordance to applicable AWWA Standards. Allowable tolerances for size and length will be as follows:

Fence Post Tolerances	
Dimension	Tolerance
≤ 4-inch (100 mm) diameter	+1/2 inch (13 mm), No minus tolerance
> 4-inch (100 mm) diameter	+1 inch (25 mm), No minus tolerance
All Lengths (any diameter)	No limit on over length, Minus 1 inch (25 mm)

1050.2.2.1 Grade. Wood for posts shall be sound, free of decay, excessive knots and of end splits and seasoning checks that might affect serviceability. Posts shall be free of multiple crooks, except crooks in one plane only in accordance with [Sec 1050.2.2.2](#) will be permitted.

1050.2.2.2 Straightness. A straight line drawn from the center of one end of the post to the center of the opposite end shall not deviate from the longitudinal axis of the post at any point more than one percent of the length of the post.

1050.2.2.3 Manufacture. Posts shall be clean peeled to remove all bark, except that strips of inner bark no more than 1/2 inch (13 mm) wide or more than 3 inches (75 mm) long will be permitted to remain on the peeled post. All protruding knots shall be trimmed flush, and all spurs and splinters shall be removed. The natural taper of round posts shall be followed in machine peeling operations. The ends of all posts shall be cut square, except posts to be driven shall be machine-pointed on the small end prior to treatment.

1050.2.3 Posts for One-Strand Access Restraint Cable. Posts for one-strand access restraint cable may be round or rectangular, as shown on the plans. Round posts shall be in accordance with [Sec 1050.2.2](#). Rectangular posts shall be standard rough sawn and of the

grade specified in [Sec 1050.2.2.1](#). All posts shall be of the specified species and pressure-treated as shown in Table I.

1050.2.4 Posts for Signs. Posts for signs shall be rectangular, rough sawn or surfaced four sides (S4S), with square cut ends, and shall be of the grade, size and length shown on the plans. Posts shall be pressure-treated as shown in Table I for the noted species. Other preservatives and wood species shall be in accordance with applicable AWWA Standards. If framing and boring is completed after pressure treatment, field treatment shall be in accordance with [Sec 1050.7](#).

1050.3 Lumber and Timber.

1050.3.1 Species and Grade Requirements. Unless otherwise specified, lumber and timber to be used as a permanent part of a structure shall be one of the species shown in Table I or other treatable species as specified in the AWWA Standards, and of the grade specified on the plans. Lumber and timber for temporary structures shall be of the species and grades shown on the plans.

1050.3.2 Dressing Requirements. Lumber and timber shall be standard rough sawn or shall be surfaced as specified in the contract. Lumber and timber shall be cut to exact lengths or to permissible variations in lengths shown in the contract documents.

1050.3.3 Treatment. If treatment is specified, lumber and timber shall be pressure-treated as shown in Table I for the noted preservatives or in accordance with the applicable AWWA Standards for other types of preservatives.

1050.4 Electric Substation, Service and Span Wire Assembly Poles.

1050.4.1 Electric Substation and Services Poles. Electric substation and service poles shall be of the length and class specified in the contract documents, and shall be in accordance with ANSI 05.1. Poles shall be of the species and type of preservative shown in Table I. Poles may be gained and drilled in the field after treatment. Areas exposed shall be treated in accordance with [Sec 1050.7](#) before cross-arms or equipment are mounted.

1050.4.2 Span Wire Assembly Poles. Span wire assembly poles shall be of the length specified in the contract and shall be in accordance with ANSI 05.1, Class IV, unless otherwise specified. The poles shall be of the species and type of preservative shown in Table I. All poles shall have a minimum diameter of 6 3/4 inches (170 mm), measured at the top of the pole.

1050.4.3 Pole Crossarms. The species, grade and treatment of crossarms to be erected on substation and service poles will be shown on the plans.

1050.5 Round Timber Piles.

1050.5.1 Material All round timber piles shall be in accordance with ASTM D 25, except for size, which shall be in accordance with Table II for the class specified in the contract.

1050.5.2 Chemical Treatment Piles shall be pressure treated to meet the requirements shown in Table I. Framing and boring will not be required before treatment. Exposed untreated areas resulting from framing of treated piling shall be field treated in accordance with [Sec 1050.7](#). Untreated piles for use in unexposed locations or in temporary bridges shall be of the species shown in Table I or of another species approved by the engineer.

1050.6 Timber Preservatives.

1050.6.1 Creosote. Creosote shall be in accordance with AWPA P1.

1050.6.2 Pentachlorophenol. Pentachlorophenol shall be in accordance with AWPA P8 in a hydrocarbon solvent meeting the requirements of AWPA P9, Type A.

1050.6.3 Ammoniacal Copper Arsenate (ACA) or Chromated Copper Arsenate (CCA). Ammoniacal Copper Arsenate and Chromated Copper Arsenate shall be in accordance with AWPA P5.

1050.6.4 Copper Naphthenate For Repair. Copper Naphthenate shall be prepared with a solvent in accordance with AWPA Standard P9. The preservative concentration shall contain a minimum of 2 percent copper metal.

1050.6.5 Responsibility for Quality. The contractor shall use preservatives that meet these specifications or the treated material will be subject to rejection, or to approved retreatment with an approved preservative.

1050.6.6 Final Steaming. All guardrail, one-strand access restraint cable, sign posts; substation, service and span wire poles; and lumber and timber, except material treated with ACA or CCA, shall be cleaned by a final steam bath in accordance with AWPA C2, C4 or C5, as applicable. In lieu of steam cleaning, sign posts may be strip stacked and air-dried for a minimum of 60 days after treatment.

1050.7 Care After Treatment. Care shall be taken in handling pressure-treated material to avoid damage. Cant hooks, peavies, pickaroons and end cant hooks shall not be used on the side surfaces of treated material. All handling of treated round stock with pointed tools shall be confined to the ends. If damaged material is permitted for use by the engineer, or framing at site is required, such injuries, cuts or holes shall be liberally field-treated with the preservative of the same type used for the original treatment, or of copper naphthenate. A second coat shall not be applied until after the first coat has been absorbed. Creosote preservative shall be hot when applied. Holes shall be treated by plugging one end and filling with preservative.

1050.8 Inspection Requirements.

1050.8.1 Inspection. All material shall be inspected for compliance with these specifications in accordance with AWPA Standard M2.

1050.8.1.1 Timber products treated within the State of Missouri or within 100 air miles (160 air km) of the border may be inspected by MoDOT personnel.

1050.8.1.2 The inspection of lumber, timber, piling, posts and poles shall be performed by the supplier or an approved inspection agency, and the cost for inspection shall be at the contractor's expense.

1050.8.2 Inspection Agency. An approved inspection agency will be a laboratory, accredited by the American Lumber Standards Committee, P.O. Box 210, Germantown, MD, or an experienced testing laboratory approved by the engineer. Inspection agencies not accredited by the American Lumber Standards Committee shall submit for approval a resume to Construction and Materials. The resume of the agency shall include the agency's history of inspection of timber and treated products, a listing of state highway agencies which have approved the inspection agency and a listing of state agencies for which the inspection agency has performed inspection.

1050.9 Certification. The contractor shall furnish to the engineer certification from the supplier or inspection agency that the material furnished is in accordance with these specifications. Certification shall include or shall have attached a listing of the material being supplied. Except as noted, the certification shall have attached a certified test report, as detailed in Section 7.2 of AWPAs Standard M2, from the supplier or inspection agency attesting to complete compliance with AWPAs and these specifications. Electric substation, service and span wire assembly poles will not require certified test reports.

1050.10 Acceptance. Acceptance of material will be based on satisfactory supplier's certification or inspection agency certifications, and upon results of any tests deemed necessary by the engineer at destination to ascertain compliance with these specifications.

TABLE I						
	Species		Type of Preservation and Minimum Retention,^a Pounds per cubic foot of wood (kg/m³ of wood)			Treated in accordance with AWPA Specification
	Southern Pine	Douglas Fir	Pentachlorophenol	ACA or CCA	Creosote	
Round Posts for Guard Cable	X		0.50 (8.0)	0.50 (8.0)		C5
Rectangular Posts for Guard Cable	X	X	0.60 (9.5)	0.60 (9.5)		C2
Posts and Blocks for Guardrail	X	X	0.60 (9.5)	0.60 (9.5)		C2
Posts for Fence	X		0.40 (6.5)	0.40 (6.5)	8 (130)	C5
Posts for Signs	X	X	0.40 (6.5)	0.40 (6.5)		C2
Lumber and Timber	X	X	0.60 (9.5)	0.60 (9.5)	12 (190)	C2
Poles	X		0.38 (6.0)	0.60 (6.0)		C4
Round Timber Piles	X				12 (190)	C3

^aWhere more than one species or type of preservative is shown, the contractor may furnish either.

TABLE II																		
ENGLISH																		
Circumferences and Diameters of Timber Piles, (in.)																		
Length ft	Class A				Tip		Class B				Tip		Class C				Tip	
	3 ft From Butt						3 ft From Butt						3 ft From Butt					
	Min		Max		Min		Min		Max		Min		Min		Max		Min	
	Cir	Dia	Cir	Dia	Cir	Dia	Cir	Dia	Cir	Dia	Cir	Dia	Cir	Dia	Cir	Dia	Cir	Dia
Up to 50	47	15	57	18	28	9	38	12	63	20	25	8	38	12	63	20	25	8
Over 50	47	15	57	18	25	8	41	13	63	20	22	7	38	12	63	20	22	7
METRIC																		
Circumferences and Diameters of Timber Piles, (mm)																		
Length m	Class A				Tip		Class B				Tip		Class C				Tip	
	900 mm From Butt						900 mm From Butt						900 mm From Butt					
	Min		Max		Min		Min		Max		Min		Min		Max		Min	
	Cir	Dia	Cir	Dia	Cir	Dia	Cir	Dia	Cir	Dia	Cir	Dia	Cir	Dia	Cir	Dia	Cir	Dia
Up to 15	1200	380	1450	460	710	230	965	305	1600	510	660	200	965	305	1600	510	635	200
Over 15	1200	380	1450	460	630	200	1040	330	1600	510	560	180	965	305	1600	510	560	180