

MATERIALS DIVISION

 Virginia Department of Transportation
MEMORANDUM

GENERAL SUBJECT: Chapter II – Methods and Frequencies of Sampling		NUMBER: MD 290-07
SPECIFIC SUBJECT: Sections 204.29, 204.33, 205, 207.02 and 207.04 Preservatives, Structural Timber, Lumber, Wood, Fence and Sign Posts and Poles		DATE: April 6, 2007
DIRECTED TO: District Construction Engineers	SIGNATURE: Andrew Mergenmeier, PE <i>Signature on original copy of memorandum</i>	

The purpose of this memorandum is to compliment the changes incorporated into Section 236 Wood Products of the Road & Bridge Specification Book. The changes to the specification were warranted based on the changes made in the American Wood-Preserver’s Association (AWPA) designations of treatment categories, the introduction of new preservatives for the home users' market and confusion on the interpretation of EPA proposed rules for the wood treatment industry.

The American Wood-Preserver’s Association has eliminated the C2 and C3 categories found in the 2004 or older AWPA standards. The old Section 236 referred to these two categories. The AWPA "C" categories have been replaced with a “Use Category System” (UC) and “Commodity Specification” designation. The new Section 236 will refer to Use categories such as UC4A, UC4B, UC4C and UC5B that categorize wood product preservative treatments based on usage and the expected exposure conditions for the wood.

Under the wood treatment regulations suggested by the EPA, VDOT construction and maintenance related activities fall under the industrial category and Chromated Copper Arsenate (CCA) treated lumber is acceptable and the preferred preservative. Construction of handrails, playground equipment and or picnic tables that are designed for hand contact will be treated with the new types of waterborne preservatives listed in the specification. The new types of waterborne preservatives are highly corrosive to metal fasteners or connectors that come in contact with the wood. Aluminum sign substrates react with these new preservatives. Therefore this memorandum attempts to compliment the specification by clearly designating and delineating which preservative is acceptable for each identified wood product usage.

A waterborne preservative (CCA) is preferred for clean surfaces. VDOT will allow oil borne preservatives in other projects for bridge timbers, piles and lumber. These oil borne preservatives are creosote (CR) and pentachlorophenol (PCP).

The predominate wood species available is southern yellow pine and in most cases, UC4A will be the requirement for ground contact wood for sign and fence posts. However, where the wood is exposed to a more severe environment (i.e. frequent flooding) or hard to replace/critical/safety items such as bridge

timbers, piles, bridge decking and guardrail posts UC4B has been recommended. In salt water or brackish water UC5B is recommended because of the wood borers in this environment.

The Materials Division has had significant help and input from several divisions in putting together these specifications. Safety and Health was consulted in determining that alternative wood preservatives will only be required for handrails, playground equipment and or picnic tables. Environmental was consulted on CCA and creosote usage and interpretation of EPA guidelines. Project specifications used in the timber initiative a few year ago were consulted on creosote use and storage. L&D was consulted on guardrail posts.

Revise Materials Division Manual of Instructions Section 204.29 by replacing it with the following:

Sec. 204.29 Preservatives, Timber

Wood treatment conforming to the applicable VDOT specifications will be accepted on a certification from a wood treatment facility on approved list (#45).

Wood treating facilities must meet the following requirements in order to be placed on the approved list and supply VDOT:

- 1. The facility shall certify the treatment of their product according to AWPA Standards.*
- 2. The wood treating facility shall allow VDOT or representative to enter facility for the inspection of wood treatment processes, wood testing (wood boring, penetration and retention) and to obtain copies of test results and quality control procedures.*

Approved List (#45) Requirements – The wood treating facility must meet the following requirements listed below to be placed on the Approved List. VDOT reserves the right to modify these requirements on a case by case basis.

The facility shall maintain a current AWPA membership and participate in a third party inspection program. (For example: TPI, SPIB, etc.)

Initial Requirements - Samples of wood from 10 separate and varied retentions shall be tested for penetration and retention by the wood treatment facility. Retention shall be tested per AWPA A9 (X-Ray Fluorescence Spectroscopy). These samples and the test documentation shall be sent to VDOT Central Laboratory for analysis. VDOT Central Laboratory may analyze the treated wood samples; compare lab results, and review treatment facility inspection reports and documents. Once approved, the wood treatment facility will be notified and shall be placed on the approved list (# 45).

Annual Monitoring Requirements - Each wood treatment facility on the approved list (#45) will be evaluated at least annually for the initial requirements listed above. However, boring samples and test results from 2 separate retentions will be tested by the facility and sent to the VDOT Central Laboratory for analysis. If monitoring results are accepted, the treatment facility will remain on the approved list. If problems in the facility or with sample testing are discovered, VDOT will notify the facility of the problems and attempt to resolve them. If resolution cannot be made, the facility will be removed from the approved list. Re-approval of

the wood treatment facility will be allowed at VDOT Central Laboratory's discretion. Records of the monitoring testing shall be kept on file at the wood treating facility for three years.

Batch/Charge Testing Requirements – *If the wood treatment facility is not on the approved list (#45), batch/charge testing is required. VDOT or representative will observe the taking of 10-20 boring samples and the testing for penetration and retention. The ground wood samples will be forwarded to VDOT Central Laboratory. The Central laboratory will test the samples and compare the results with those obtained by the facility. If the specifications are met, that batch/charge will be accepted. VDOT reserves the right to modify these requirements on a case by case basis.*

Certification Requirements:

The wood treating facility will furnish a certification on each (Charge, PO, Batch No.) or shipment of material. The certification shall include a description of the wood items being treated, the quantity, type of preservative used, retention and the consumer use category.

*Example: 12 10" Butt 40' Piles CCA Retention = 1.0 UC4C
20 4x4x12' Posts CCA Retention = 0.40 UC4A*

The certification should also contain the following certification statement.

"Name of Manufacturer certifies that the treated wood products for (Charge, PO and Batch No.) have been treated in accordance with AWP standards, Section 236 of the VDOT Road & Bridge Specifications and meets the applicable minimum penetration and retention requirements."

Revise Section 204.33 as shown below:

Sec. 204.33 Structural Timber and Lumber

~~(Sec. 236) See Sec. 207 for details of acceptance on modified inspection. Sampling of structural timber, timber piling, lumber, posts, etc. will not be necessary in the field. The penetration and retention of the preservative treatment is determined, as outlined in Sec. 236 of the Road and Bridge Specifications, at the point of treatment in the case of treated timber or lumber. Acceptance of timber and lumber shall be as stated in Section 204.29. The lumber shall be visually inspected for grade mark. Inspection of timber and lumber materials will be reported on Form TL-109, as outlined in Sec. 800.~~

The lumber shall also be visually inspected for Type of Preservative and Use Category System. These designations may be found on a label affixed to the wood or the certification document.

The Use Category system utilizes letters and numbers to describe the exposure conditions (Ex. UC4A = ground contact)

The four major Use Category System designations encountered in VDOT maintenance and construction work are:

UC4A: Ground contact, fresh water contact or other conditions favorable to wood deterioration. (Ex: sign posts, fence posts and gates).

UC4B: Ground contact in severe environments, critically important components and

salt water splash zones (Ex: bridge timbers, bridge decking, guardrail posts and offset blocks).

UC4C: Ground contact in very severe environments, or climates with an extremely high potential for deterioration of critical structural components.

(Ex: foundation pilings).

UC5B: Wood exposed to salt and brackish water (Ex: piles, bracing and bulk-heads).

The Primary wood preservative used for VDOT maintenance and construction work is CCA.
 Bridge timbers and lumber may be treated with creosote (CR) and pentachlorophenol (PCP).

Table 1 - Pine Treatments & Retentions using the Use Category System					
Commodity Specifications		Use Category	Preservative Retentions		
			Waterborne (pcf)	Oil borne (pcf)	
Designation	Wood Usage		CCA	CR	PCP
A	Sawn Products:				
	Boards, lumber and timber	UC4A	0.40	10.0	0.50
	Lumber and Timber products for bridges	UC4B	0.60	10.0 *	0.50
B	Posts:				
	Round, 1/2 and 1/4 round, building, fence and guide sign posts, poles < 16 feet in length.	UC4A	0.40		
	Guardrail Posts and offset blocks	UC4B	0.50		
E	Round Timber Pilings:				
	Pilings and foundations for land and fresh water use	UC4C	0.80	12.0	0.60
F	Wood Composites:				
	Plywood	UC4A	0.25	10.0	0.50
	**Glue laminated members (post-gluing)	UC4A		10.0	0.60
	**Glue laminated members (pre-gluing)	UC4A	0.40	10.0	0.60
	Laminated veneer lumber	UC4A		10.0	
G	Marine Applications (salt water)				
	Plywood & Solid Sawn	UC5B	2.5	25.0	
	Piles (outer zone/inner zone)	UC5B	2.5/1.5	20.0	
	Sawn - Dual treatment: CCA with CR	UC5B	1.5	20.0	
	Piles - Dual treatment: CCA with CR	UC5B	1.0	20.0	

* Creosote (CR) preservative is not allowed for bridge decks.

** Glue laminated members must certify glue is compatible with treatment.

Note: All data from AWWA 2005 Standard

For any product not listed refer to the latest AWWA Standard

VDOT allows oilborne preservatives for special projects. These are Creosote (CR) and Pentachlorophenol (PCP).

Construction of handrails, playground equipment and/or picnic tables that are designed for hand contact will be treated with waterborne preservatives (ACQ-B and CA-B) listed in Section 236. These waterborne preservatives are highly corrosive to metal fasteners, connectors and aluminum signs. Consequently, metal fasteners and connectors used with these alternative wood treatments shall be either stainless steel or hot dipped galvanized steel.

Table 2 - Pine Treatments & Retentions for Hand-Contact Surfaces				
Commodity Specifications		Use Category	Preservative Retentions	
Designation	Wood Usage		Waterborne (pcf)	
			ACQ-B	CA-B
A	Sawn Products: Boards, lumber and timber for picnic tables, handrails, playground equipment	UC4A	0.40	0.21
	Wood Composites: Plywood for picnic tables, handrails, playground equipment	UC4A	0.40	0.21

Note: All data from AWP 2005 Standard.
For any product not listed refer to the latest AWP Standard

Use Category System Procedure and Tables

For VDOT use, the major wood products, “Use Categories” and associated treatment retention quantities are provided in the above tables.

The basic steps in using the 2005 AWP Standard are listed below:

1. Identify the wood product to be treated – these are listed as Commodity Specifications (A-I).
2. Identify the exposure conditions the wood will be subjected to – these are listed as the “Use Categories” (UC4A, UC4B, etc.)
3. Identify the recommended treatment solution (CCA, ACQ-B, CR, etc.)
4. Locate the required treatment retention quantity from the tables in the AWP Standard.

Revise Section 205 Minimum Acceptance Sampling Requirements tables as follows:

MINIMUM ACCEPTANCE SAMPLING REQUIREMENTS					
MATERIAL AND TEST	ROAD AND BRIDGE SPECIFICATION REFERENCE	RATE OF SAMPLING	LOCATION FOR SAMPLING	PROPER CONTAINER AND PACKING	REMARKS
16(c) (2) Wood, Treated	242	Visual. No samples required on project.			Usually, preservative , penetration and retention approved at point of treatment. See Secs. 204.29 and 204.33. <i>Certification Required</i>
25(e) Timber...	236	Requires no testing or certification, but does require shop inspection. See remarks-Visual. No samples required on project.			Preservative and treatment Penetration and retention approved at point of treatment See Secs. 204.29 and 204.33. Untreated timber piling accepted on modified inspection. See Sec. 207. <i>Certification required</i>
28(b) (2) Wood Posts and Braces (Treated).....	236	Visual. Normally, no samples required on project. See Remarks-Visual No samples required on project			Preservative and treatment Penetration and retention usually approved at point of treatment. See Secs. 204.29 and 204.33. <i>Certification required.</i> Locust posts require no treatment, testing, or certification. See Sec. 207 for modified acceptance.

MINIMUM ACCEPTANCE SAMPLING REQUIREMENTS

MATERIAL AND TEST	ROAD AND BRIDGE SPECIFICATION REFERENCE	RATE OF SAMPLING	LOCATION FOR SAMPLING	PROPER CONTAINER AND PACKING	REMARKS
29. Preservatives, Timber..	236	One qt. (1 L) per treatment of State work to Central Office Laboratory. See Remarks. Sample same as "Asphalt" in Sec. 204.05(b)(1).	At treatment point only from charge tank.	Metal container with secure top.	If consecutive treatments used on State work, one sample may represent more than one charge, but must be resampled after 5 consecutive treatments.
33. Structural Timber and Lumber....	236	Accepted on modified inspection. No samples required. See Remarks. Visual. No samples required on project		4	Penetration and retention of treatment is determined at point of treatment, as outlined in Sec. 246, Sec 236 Road and Bridge Specs. Preservative is sampled at point of treatment, as outlined in Sec. 204.29 herein. See also Sec. 207 for modified acceptance. Certification required

Revise Section 207.02 Materials for General or Routine Construction as shown below:

(32)

(h) Treated wood fence and guardrail posts. ~~(Normally not sampled on project. Preservative and treatment for treated posts approved at point of treatment.)~~ ~~(Up to 10 Guardrail Posts for GR-7 may be accepted on visual inspection.)~~ ~~(Up to 25 sign or fence posts, where #2 Southern Pine is permitted will require no testing or certification if each unit is properly tagged, indicating both Grade #2 and the preservative treatment retention exceeds 0.40 pounds per cubic foot (6.4 kilogram per cubic meter) and/or "ground contact" Up to 10 Guardrail Post for GR-7 where Grade No. 1 Dense Southern Pine is required and 25 sign/fence posts, where Grade No. 2 Southern Pine is permitted, may be accepted on visual inspection if they meet the requirements of Section 236 and AWPAs Use Category System for retention.~~

(37) Structural timber and lumber. ~~(Requires no testing or e-Certification required. Preservative and treatment Penetration and retention approved at point of treatment.)~~

Revise Section 207.04 Materials for Signalization and Electrical System Installation as below:

(29) ~~Poles, wood treated, for traffic signals, ANSI 05.1, or other. (Require no testing or certification. Preservative and treatment approved at point of treatment.)~~ *Poles and wood treated for traffic signals (ANSI 05.1). Penetration and retention approved at point of treatment. Certification required.*

cy:

- Chief Engineer
- State Construction Engineer
- Resident Administrators
- Area Construction Engineers
- District Materials Engineers
- American Concrete Paving Association NE Chapter, Southern Region
- Virginia Dept. of Minority Business Enterprise
- Virginia Ready-Mixed Concrete Association
- Federal Highway Administration
- Virginia Transportation Construction Alliance
- Precast Concrete Association of Virginia
- Old Dominion Highway Contractors Association