

**KANSAS DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION TO THE
STANDARD SPECIFICATIONS, EDITION 2015**

Delete SECTION 2301 and replace with the following:

SECTION 2301

WOOD POSTS

2301.1 DESCRIPTION

This specification governs wood posts and offset blocks for guardrail, and wood sign support posts. This specification does not cover wood fence posts. It establishes a prequalified plant system for producers of treated wood products with verification at the job site. The source document for all treatment related requirements referenced in this specification is the American Wood Protection Association's (AWPA) 2015 Book of Standards.

2301.2 REQUIREMENTS

a. General.

(1) Any plant producing wood posts and offset blocks for guardrail, and wood sign support posts through this specification must be currently prequalified. A plant is any facility that produces the posts as the final treated product. Prequalification requires a thorough inspection by KDOT and comparison testing to verify the plant has the capability to comply with this specification. Procedures for prequalification are outlined in **subsection 2301.4**.

(2) Unless shown otherwise in the Contract Documents, produce all posts provided under this specification to meet the applicable subsections.

(3) Quality Assurance inspection of wood posts and offset blocks for guardrail; and wood sign support posts will be done at the job site on a random, project by project basis as outlined in **subsection 2301.4e**.

(4) Wood species not listed but meeting or exceeding these specifications will be considered by the Bureau Chief of Construction and Materials upon written request.

(5) Unless shown otherwise in the Contract Documents, treat material listed under this section with a preservative treatment in accordance with **subsection 2301.2e**.

b. Material Specifications and Grading Rules. Comply with the applicable parts of the following:

(1) ASTM D 245.

(2) Standard grading rules as set forth by Southern Pine Inspection Bureau.

(3) Standard grading rules as set forth by Western Wood Products Association.

(4) Product Standard 20 American Softwood Lumber Standard as set forth by the U. S. Department of Commerce.

(5) Any commercial grading rules that will provide material of equal or greater stress value may also be used. The burden of proof regarding the equality of the proposed rules lies with the supplier.

(6) Provide materials that are free of decayed wood, rot, red heart, and detrimental compression wood.

(7) **F_b defined.** F_b is the minimum extreme fiber strength in bending under dry conditions (from grading rules tables). Specific requirements for each type of product supplied are outlined in the paragraphs below.

c. Guardrail Posts and Offset Blocks.

(1) Provide posts and offset blocks, surfaced on four sides (S4S) that complies with the dimensions and details shown in the Contract Documents.

(2) Unless shown otherwise in the Contract Documents, provide posts and offset blocks graded No. 1 (posts and timbers – 5 inch X 5 inch and larger), with a minimum extreme fiber strength in bending, F_b, of 1200 psi, regardless of species. Sterilize posts and offset blocks by kiln drying.

d. Sign Support Posts.

(1) Posts provided under this specification are S4S and comply with the dimensions and details shown in the Contract Documents.

(2) Unless shown otherwise in the Contract Documents, provide posts of the species listed and graded as follows:

Southern Pine:

- 4 inch X 4 inch, No. 1 Dense, $F_b = 1650$ psi
- 4 inch X 6 inch, No. 1 Dense, $F_b = 1500$ psi

Douglas Fir – Larch or South:

- 4 inch X 4 inch, Select Structural, Base Value $F_b = 2000$ psi
- 4 inch X 6 inch, Select Structural, Base Value $F_b = 1750$ psi

Note: Douglas Fir base values include size factors.

e. Preservative Treatment and Handling of Wood Products.

(1) General. Treat all wood products with a wood preservative registered by the U.S. Environmental Protection Agency under the Federal Insecticide, Fungicide and Rodenticide Act.

(a) Treat all wood products provided under this section to satisfy all requirements of (AWPA) Standard U1, “User Specification for Treated Wood”. Within U1, satisfy the requirements of Commodity Specification A: Sawn Products and the Use Category (UC) described below.

(i) Sign Support Posts - UC4A

(ii) Guardrail Posts and Offset Blocks - UC4B

(b) Treatment processes not listed but meeting or exceeding this section will be considered by the Bureau Chief, Construction and Materials, upon written request.

(2) Preservative Types. Use Chromated Copper Arsenate Type C (CCA-C) that complies with AWPA Standard P23.

(3) Fabrication. No field fabrication will be permitted, unless shown otherwise in the Contract Documents. Complete all adzing, boring, chamfering, framing, gaining, incising, surfacing, and trimming prior to treatment.

(4) Treatment Processes.

(a) Comply with all requirements of AWPA Standard T1, “Processing and Treatment Standard”, including any special requirements for the Commodity Specifications and use Categories and Commodity Specification specified above. See AWPA Standard T1, Table 3.2B, for minimum retention values of individual components and component sums.

(b) Stamp or tag each treated piece with the plant identification and minimum specified treatment recorded in pounds per cubic foot (PCF).

(5) Handling. Load, unload or transfer treated posts and blocks using procedures specified in AWPA M4, “Standard for the Care of Preservative-Treated Wood Products”.

(6) Shipments. Do not ship treated material while still dripping. Unless kiln dried, retain it in the treatment yard for a minimum of 3 days. Retain the material in the treatment yard a minimum of 7 days when the ambient temperature remains below 60°F.

(7) Storage.

(a) Place treated wood products on treated or non-decaying skids or cribbing, that are positioned to support the material to minimize distortion.

(b) Sign Support Posts. Stack and tightly band with spaced layers to permit air flow between each layer and minimize warping. Banding consists of 1 band for each 4 feet of bundle length, with a maximum spacing of four feet between bands, end bands being not more than 1 foot from the end of the bundles. Place spacers (stickers), a minimum of 1/8 inch in thickness, between each horizontal layer of posts at each banding location.

(c) Others. Tightly band all other wood products to minimize warping.

(d) Place the material in an area free of debris, decayed wood, and dry vegetation, and with sufficient drainage to prevent material from being subjected to standing water.

(8) Damage During Shipment. Damage affecting the structural integrity or utility of the item is cause for rejection.

2301.3 TEST METHODS

Conduct all measurements, visual inspection, and grading for the wood products according to the procedures specified in **subsection 2301.2b**. For preservative treatment, sample preparation and analysis will be performed as

set forth in AWWA Standard A9, "Standard Method for Analysis of Treated Wood and Treating Solutions by X-Ray Spectroscopy".

2301.4 PREQUALIFICATION

a. General.

(1) Contact the Bureau Chief of Construction and Materials to arrange for the required sampling, observation of testing procedures and review of the plant quality control program.

(2) The plant is to absorb all expenses associated with the inspection by the Engineer's representative. This includes travel, subsistence and lodging, and the expenses of shipping any selected specimens to KDOT.

(3) It is the option of the Bureau Chief of Construction and Materials to grant prequalified status to a plant based upon the qualification test and inspection results of transportation agencies of other states.

(4) A plant will be notified in writing in the event of any change in their prequalified status. The Bureau of Construction and Materials will maintain a list of all plants that are prequalified to provide wood guardrail posts and offset blocks, and wood sign support posts to KDOT projects.

b. Plant Quality Control Requirements. The plant must have a quality control section identified within its organization that is adequately staffed to perform the required lot-by-lot testing. The plant laboratory must have proper equipment, calibrated annually according to the requirements of the equipment manufacturer's recommendations, with which to adequately perform all measurements, visual inspection, and testing related to **subsections 2301.2b.** and **2301.2c.** Provide a copy of the plant quality control plan to the Engineer's representative during the plant inspection. As a minimum, the plan will include 1) grading procedures and personnel qualifications, 2) treatment procedures and personnel qualifications, 3) record keeping procedures and personnel, 4) copy of plant identification stamp or tag, and 5) notification and resubmittal in the event of any changes to procedures and personnel, or the quality control plan.

In addition, the plant must be audited at least annually to verify that grading practices adhere to **subsection 2301.2b.** Provide a copy of the plant's latest audit report to the Engineer's representative during the plant's prequalification inspection.

c. Sampling and Testing Procedure. The Engineer's representative will select the test samples, at random, at the plant. Provide access to all facilities necessary for the Engineer's representative to randomly select samples from all bundles/charges as defined below. Samples for comparison of treatment testing will be selected from the finished product. Provide plant personnel to handle and label necessary bundles/charges from the randomly selected samples.

(1) Lot size. All stock within a lot is subject to sampling unless exceptions are authorized by the Bureau Chief of Construction and Materials.

The lot of wood that is subject to sampling for treatment comparison includes all finished products of material described in this specification that are in stock.

(2) The lot sample size will be 10 charges of finished product.

(3) Sample preparation. Storage and handling of the products will be evaluated during this phase.

Take borings from the finished product bundles where they are stored. Bundles may need to be broken open and moved around for sampling access. Take borings of the finished product as described in the AWWA Standard M2, "Standard for Inspection of Wood Products Treated with Preservatives". Take 30 borings from each of the 10 selected charges of finished product. Assign each sample, consisting of the 30 borings, a unique identification number. Determine the depth of penetration (AWWA Standard T1, Commodity Section A12) for each core then trim all 30 cores to the specified assay zone (AWWA Standard T1, Commodity Section A11) and grind as required by the test method. Place each sample in a sealed container and durably affix the sample identification number to each container. The sample, or a portion thereof, is tested by the plant. After plant testing is completed, combine the tested and untested portions of the sample so that comparison testing can be performed by KDOT. Conduct all sample preparation operations in the presence of the Engineer's representative.

(4) Testing. Prepare and test each sample according to AWWA Standard A9. For the purpose of comparing the plant and KDOT testing laboratories, each of the 10 samples (1 sample per charge) is to be tested by each laboratory. Provide all the necessary facilities and test records required by the Engineer's representative to witness the tests. Record the plant test results onto a KDOT form and sign the form. Provide these results and the remaining companion samples to the Engineer's representative.

(5) Review and Comparison of Test Results.

- (a) 80% of the cores taken for each sample shall meet the penetration requirements (AWPA Standard T1, Section A12).
- (b) Retention of preservative shall not be less than that specified in AWPA Standard U1, Commodity Specification A, Section 3.0, UC as specified in **subsection 2301.2e.(1)** for the type of finished product sampled and tested. Retention of individual preservative components shall not be less than that shown in AWPA Standard T1, Table 3.2B.
- (c) KDOT's treatment testing results will be compared to the producer's results for each sample, taking into consideration the reproducibility (different operator in different laboratory) expressed in the precision table in AWPA Standard A9. None of the samples may fall outside the acceptable range.
- (d) A sample that fails the penetration, retention or comparison requirements may be re-sampled 1 time only, and on a 2-for-1 basis (both samples must pass or the entire lot fails). It is preferable that the resamples be removed from the same failed charge if that charge is still available. The results of the resample specimens will replace the initial test results. If the failed charge is no longer available, a new randomly selected charge is used for the basis of the 2-for-1 testing.

d. Plant Status.

(1) Attainment of prequalified status. In order for a plant to be prequalified to provide wood guardrail posts and offset blocks, and wood sign support posts to KDOT projects, comply with the requirements referenced in **subsection 2301.4c. (5)**.

(2) Renewal of prequalified status. The following schedule will apply to plants that have attained their initial prequalification status:

- (a) One year after the initial prequalification, the plant will again be evaluated according to **subsection 2301.4**.
- (b) For plants that retain prequalification after the second evaluation, the next evaluation will be required after a 2-year time interval.
- (c) For plants that retain prequalification after the third evaluation, the required evaluation time interval will be extended to 3 years thereafter provided the plant maintains continuous prequalification and is not disqualified.
- (d) A prequalified plant that becomes disqualified may regain prequalified status at the next annual renewal inspection, but must comply with all the requirements that apply to initial prequalification including the re-inspection schedule outlined above. The disqualified plant may petition for an immediate re-evaluation provided it can be demonstrated that the disqualifying deficiencies have been corrected.
- (e) A plant that chooses not to renew its prequalified status, but then later chooses to again prequalify must comply with all the requirements that apply to initial prequalification, including the re-inspection schedule outlined above.

(3) Disqualification. All prequalified plants that are currently providing wood posts for KDOT projects will have their product quality monitored through the use of verification inspections as described in **subsection 2301.4e**. Failure of 2 verification samples within 1 year of each other will result in disqualification of the plant and removal from the prequalified source list. In the event of disqualification, the plant is subject to the requirements of **subsection 2301.4d.(2)(d)**. A plant that fails to comply with these requirements 2 times, consecutive or otherwise, will be permanently disqualified unless an exception is granted by the Bureau Chief of Construction and Materials due to change in ownership, plant management or other significant reorganization.

e. Quality Assurance.

(1) Verification Inspections. During the course of each year, the Wichita Regional Materials Laboratory will randomly select a minimum of 1 project or contract containing wood posts provided by each of the prequalified plants. The Wichita Regional Materials Laboratory will contact the District administering these projects or contracts for scheduling of the field verification testing. Upon notification of a verification inspection, the Contractor is required to store materials in a manner allowing easy access for inspection and, upon arrival of the Engineer's representative, provide adequate manpower for the handling and re-stacking of the product.

(2) Verification Testing.

- (a) All materials used on the project are considered to be 1 lot and will be subject to treatment verification testing. A minimum of 30 randomly selected pieces will be selected. Then, a single boring from each of the selected pieces will be tested for penetration and retention. Borings will be

taken as described in AWWA Standard M2 and tested in accordance with AWWA Standard A9. If the sample fails to meet the requirements of subsections **2301.4c.(5)(a) and (b)** for penetration or retention, it is cause for rejecting the entire lot.

(b) In the event that the verification samples fail to comply with the preceding, the Engineer's representative may randomly resample the lot 1 time only on a 2 to 1 basis, or reject the lot. If the lot is re-sampled, then both samples must pass, or the entire lot is rejected. The results of the resample specimens will replace the initial test results.

(c) The Contractor is to replace the rejected lot at no additional cost to KDOT. Remove the rejected lot from the job storage site.

(3) Verification Related Costs. KDOT costs for verification inspection and testing will be borne by KDOT. Excessive inspections for replacement of rejected material may be charged to the Contractor.

2301.5 BASIS OF ACCEPTANCE

a. The plant must be currently prequalified.

b. Provide the Engineer's representative of the project with a copy of plant test reports that govern the analysis of the wood post and block lots delivered to the project. Include a report of the preservative treatment analysis for each lot. Mail a copy of the reports to the Wichita Regional Materials Laboratory, Bldg. 1, 3200 E 45th N, Wichita, KS 67220. Verify that the project number and/or the contract number appear on each report.

c. Provide the Engineer's representative of the project with shipping orders, an invoice, or cover letter that documents the project number, wood post and block sizes, job, or producer order numbers, and the total number of each lot of the represented wood posts and offset blocks delivered to the project.

d. Provide the Engineer's representative of the project with a certification stating that the wood posts and offset blocks delivered to the project comply with this specification, that the product grading complies with this specification, and that the preservative treatment complies with the applicable AWWA standards. This documentation must bear the signature and title of an official of the plant with contract binding authority, and must be notarized. This requirement may be included on the test reports referenced in **subsection 2301.5b**.

e. As a minimum, wood posts and offset blocks must be legibly stamped with the lumber grade, producers' identification, and minimum specified treatment recorded in PCF.

f. The final disposition of the wood posts and offset blocks will be completed at the final destination as the result of inspection for the quality of workmanship and the delivery condition and approval of the associated required documentation.