

Pressure Treated Wood Standard for Timber Deck Bridge Components

Definitions and Application

Lumber: Lumber is a manufactured product derived from a log in a sawmill or planing mill as defined in the National Lumber Grades Authority “Standard Grading Rules for Canadian Lumber” (**NLGA**) Para. 3 – Lumber. In respect of timber deck bridge components, the catch-all general term “lumber” used herein includes: (1) structural joists and planks (2” to 4” thick, 5” & wider), (2) structural beams and stringers (rectangular timbers, 5” & thicker, width more than 2” greater than thickness), and (3) structural posts and timbers (square timbers, 5” x 5” & larger, width not more than 2” greater than thickness).

Rough lumber: The term “rough lumber” means lumber that has not been dressed (surfaced), but which has been sawed, edged and trimmed at least to the extent of showing saw marks or equivalent on the four longitudinal surfaces of each piece for its overall length. Rough lumber is used for the following timber deck bridge components:

- guardrail (‘curbs’), riser blocks and brackets
- deck running (‘wear’) planks
- sub-deck planks
- cross-ties
- stringers
- other rough lumber components that may be utilized in bridge construction (e.g., timber sills, ballast wall timbers).

If the ministry specifies preservative treated rough lumber for bridge components, the lumber must be pressure treated to meet the requirements of this standard. Additionally, this standard must be read in conjunction with FLNR’s ***Bridge Timbers and Lumber Material Standard*** available at:

<http://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/resource-roads/brtimbermaterialstd.pdf>

A. General (applicable to all treatments)

1. Appended **Table 1** identifies four types of preservatives that may be used with the bridge components, wood species, and Use Category combinations specified in FLNR’s ***Bridge Timbers and Lumber Material Standard***. The preservatives are creosote (**CR**), pentachlorophenol in type A oil (**PCP-A**), chromated copper arsenate Type C (**CCA**) and ammoniacal copper zinc arsenate (**ACZA**). The selection and use of treated wood is the responsibility of the ministry, and therefore the ministry will specify a particular wood species and treatment type that must be utilized by the supplier in project specific purchase orders or contract documents.
2. Except for CCA-treated Coastal Douglas-fir (Coastal D-Fir) which must be treated in accordance with the ministry’s ***Interim Process Specification for CCA Treatment of Coastal Douglas-fir Wood***, and unless otherwise specified by the ministry, all allowable wood species and treatment type combinations for pressure treated wood products must conform to all the applicable requirements of **CAN/CSA 080 Series “Wood Preservation”** (CSA 080.0, 080.1, 080.2, 080.3, 080.4, and 080.5) for Use Category UC4.1¹ or UC4.2², “Wood for Highway Construction”, including requirements for incising, conditioning, preservative solution strength, manner of treatment, fixation period, markings, retention and penetration, among other requirements of CSA

¹ UC4.1: “Wood for Highway Construction”, exterior use for bridge construction, exposed to all weather cycles, ground contact or fresh water, normal exposure conditions (Ref. CAN/CSA 080).

² UC4.2: “Wood for Highway Construction”, exterior use for bridge construction, exposed to all weather cycles, ground contact or fresh water, high potential for decay, and/or difficult replacement, and/or critical structural components (Ref. CAN/CSA 080).

080 Series. *[Note: For specific one-off projects, it may be required to treat wood materials to UC5A (marine exposure) where wood materials can be exposed to salt and brackish water to the extent that marine borers can attack them.]*

3. All treated wood products for bridge components must be manufactured in their final form in accordance with the aforementioned [Bridge Timbers and Lumber Material Standard](#) before treatment to virtually eliminate the need for subsequent cutting or drilling. When cutting or drilling after treatment is unavoidable, a field treatment preservative specified in CSA 080.3 must be used and applied in accordance with its label. At least two coats must be applied.
4. Every piece of treated sawn lumber products for bridge components must be marked or labelled identifying the:
 - a. treating manufacturer;
 - b. type of preservative;
 - c. minimum preservative retention;
 - d. Use Category;
 - e. identity of the accredited third party treatment inspection agency.

B. Best Management Practices for Environmental Protection (applicable to all treatments)

1. To minimize preservative migration (loss) from treated wood intended for use in aquatic and wetland applications, the supplier must produce treated wood products in accordance with the [Best Management Practices: For the use of treated wood in aquatic and wetland environments](#) (**Best Management Practices**) issued by the *Western Wood Preservers Institute, Wood Preservation Canada, Southern-Pressure Treaters' Association, and Southern Forest Products Association*.

C. Quality Inspections and Documentation Requirements

C-1: Requirements for CCA Treated Coastal D-Fir

Quality inspection requirements (third party wood treatment inspector's qualifications and process inspections, inspector's penetration and retention testing, and inspector's acceptance of treated wood products) and supplier documentation requirements for CCA treated Coastal D-Fir are all included in the ministry's [Interim Process Specification for CCA Treatment of Coastal Douglas-fir Wood](#).

C-2: Requirements for all other Combinations of Wood Species and Treatment Types

Clauses 1 to 5 below, including appended **Table 2** and the **General Statement of Wood Treatment Conformance form** provide requirements for all other combinations of wood species and treatment types, other than CCA-treated Coastal D-Fir (see previous section).

1. **Qualifications of third party wood treatment inspector:** At its cost, the supplier must retain a third party wood treatment inspector with at least one of the following qualifications:
 - a. an accredited inspector from an agency accredited by the Canadian Lumber Standards Accreditation Board (CLSAB) for the CLSAB Treated Wood Program. (Note: Although this accreditation program is presently discontinued, the ministry will accept proof of previous accreditation with this program); or
 - b. an accredited inspector from an agency accredited by the American Lumber Standards Committee (ALSC) for the ALSC Treated Wood Program; or
 - c. a qualified treatment inspector who has the following minimum qualifications:

- i. minimum of 5 years proven experience in the wood treatment inspection industry, and performing sampling and testing of treatment plants' products on a regular, routine basis;
- ii. competent in the inspection of treated products of **Coastal Douglas-fir** and **Hem-Fir** wood species and **CR**, **PCP-A**, **CCA**, and **ACZA** preservatives;
- iii. knowledgeable in all aspects of CSA 080 Series "Wood Preservation" and the "Best Management Practices" document referenced herein;
- iv. experienced in monitoring "treating plant" processes and procedures for the purpose of assuring the uniform application of and conformance with CSA 080 Series "Wood Preservation" and quality control and inspection procedures contained therein.

Prior to award of a purchase order or contract involving the supply of treated wood, and prior to any wood treatment, the supplier must send documentation of the inspector's qualifications to the ministry for review and approval. The documentation must show how the inspector's accreditation or experience meets the required qualifications described above. This documentation must be sent by email to the **Ministry HQ Bridge Engineer** (mike.penner@gov.bc.ca) within 4 business days of being advised by the province that the bidder has supplied an acceptable bid. Alternatively the bidder may supply the required documentation as part of their bid submission to the province.

If an inspector has previously been approved by the ministry in accordance with this process, the bidder need only submit the name of the previously approved inspector.

If the ministry requests additional information pertaining to qualifications of inspectors at any time for the purposes of evaluation (or re-evaluation of previously approved inspectors), a bidder or supplier must supply the requested information within 4 business days of the request.

Prospective bidders who would like to obtain pre-approval of a third party wood treatment inspector in advance of future projects are encouraged to provide the documentation described above to the **Ministry HQ Bridge Engineer** at any time, in order that evaluation and approval may be undertaken in advance of the time constraints of any particular project.

The ministry reserves the right to reject the quote or bid of any bidder that does not provide inspector qualification documentation to the satisfaction of the ministry, in its sole and absolute discretion.

2. ***Inspector's process inspections and "General Statement of Wood Treatment Conformance"***: The third party wood treatment inspector will carry out inspections at the treatment plant as necessary, and must verify in writing, in a signed *General Statement of Wood Treatment Conformance*, that treatment has been carried out in general conformance with the applicable CSA 080 Series "Wood Preservation" and Best Management Practices. The ***General Statement of Wood Treatment Conformance form*** is attached.

<p>Note: Prior to pre-treatment inspection of any Coastal D-Fir, the supplier must provide the inspector with hard copy evidence (as per clause 5 below) that the wood to be treated is Coastal Douglas-fir. Interior Douglas-fir is <u>not</u> an acceptable species for treatment.</p>
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3. **Inspector's penetration and retention testing:** Product acceptance by the ministry for all allowable combinations of wood species and treatment types (except for CCA treated Coastal D-Fir) is based on the supplier having to meet all the applicable requirements of CSA 080 Series "Wood Preservation", including penetration and retention requirements, and Best Management Practices. Third party measurement of the penetration and retention results of the treated wood must be checked on every charge, and carried out in accordance with the procedures of CSA 080 Series "Wood Preservation" at the supplier's cost. Copies of the penetration and retention results must be provided to the ministry. Treated sawn lumber products for bridge components must meet the applicable:
- minimum penetration* requirements of CSA 080.2 for sawn lumber products, and
 - preservative retention requirements of Table 10 in CSA 080.1 for UC4.1 or UC4.2 as specified.

*Penetration must be measured and recorded in **metric units (mm)**. It is not acceptable for measurements to be taken in imperial units and then converted to metric units.

Note:

The listing of an allowable wood species with a particular preservative type combination (see attached Table 1 in this standard), or an allowable wood species and Use Category combination for various bridge components (see Tables 1 or 2 of [Bridge Timbers and Lumber Material Standard](#)), does not imply that the minimum preservative retention or penetration standards provided in CSA 080 Series "Wood Preservation" are fully achievable using that combination. Suppliers should satisfy themselves of the treatability of the source material before going ahead with major wood treatment orders.

For example, Hem-fir North from coastal British Columbia is a mixture of western hemlock and Pacific silver fir (otherwise known as amabilis fir), and suppliers should take into consideration that the treatability of Hem-fir North depends on the percentage content of Pacific silver fir, with Pacific silver fir being the more treatable component of Hem-fir North. Hem-fir North from interior British Columbia is a mixture of western hemlock and grand fir and suppliers should take into consideration that western hemlock from the interior BC region is known to be more difficult to treat than western hemlock from the coastal BC region.

4. **Inspector's acceptance of treated wood products prior to shipment:** The supplier must obtain the inspector's acceptance of the treated wood products prior to shipment. If the treated wood is part of a bridge supply order that includes general in-plant inspections performed by the ministry's in-plant quality assurance inspection agency on behalf of the ministry, the supplier must advise the inspection agency's inspector, prior to shipment, that the treated wood has been inspected and accepted.
5. **Required Documentation Deliverables:**
- All documentation in appended **Table 2** must be supplied in **electronic Adobe (pdf) format** and provided as a complete package to the specified recipients.
 - All documents must be clearly identified with the purchase order (PO) or contract document number, and with the bridge structure numbers pertaining to each applicable structure if the ministry purchase order or contract documents specify structure numbers.
 - The supplier must provide documentation within established time frames to the (1) ministry's in-plant inspection agency as applicable, (2) Ministry Bridge Engineer responsible for the order (as may be specified), and (3) Ministry HQ records (FLNREng.Branch@gov.bc.ca) in accordance with the requirements of Table 2.

Table 1 Wood Preservative Treatment Types				
Allowable Preservative Treatment Types (Note: FLNR will specify required treatment type in a purchase order or contract document)		Allowable Wood Species for Treatment	Required Treatment Standard	Bridge Components, Wood Species, and Use Category Combinations
Oilborne Preservatives	Creosote (CR)	<ul style="list-style-type: none"> Coastal D-Fir Hem-Fir North³ 	Meet or exceed CAN/CSA 080 Series "Wood Preservation" ⁴ in effect and applicable at the time of treatment	See Table 1 or 2 (as applicable) of <i>Bridge Timbers and Lumber Material Standard</i>
	Pentachlorophenol in type A oil (PCP-A)			
Waterborne Preservatives	Chromated copper arsenate, Type C (CCA)	<ul style="list-style-type: none"> Coastal D-Fir 	Apply FLNR's process specification for CCA treatment called, <u>Interim Process Specification for CCA Treatment of Coastal Douglas-fir Wood</u>	
		<ul style="list-style-type: none"> Hem-Fir North 	Meet or exceed CAN/CSA 080 Series "Wood Preservation" in effect and applicable at the time of treatment	
	Ammoniacal copper zinc arsenate (ACZA)	<ul style="list-style-type: none"> Coastal D-Fir Hem-Fir North 	Meet or exceed CAN/CSA 080 Series "Wood Preservation" in effect and applicable at the time of treatment	

Notes:

- The selection and use of treated wood is the responsibility of the ministry. The ministry will specify a particular wood species and treatment type that must be utilized by the supplier in project specific purchase orders or contract documents. The best protection from any exposure to wood treating chemicals is offered by following personal hygiene and safety precautions. See the Pest Management Regulatory Agency (PMRA) approved Consumer Product Safety information and "Consumer Safety Information Sheets" available at <http://www.hc-sc.gc.ca/cps-spc/pubs/pest/fact-fiche/sstw-msbt/index-eng.php> and <http://www.ptw-safetyinfo.ca/> or, for ACZA at <http://wwpinstitute.org/>.
- Interior Douglas-fir is **not** an acceptable species for treated wood orders, in accordance with Table 6 ("Wood Species and associated use categories-Sawn products") of CAN/CSA 080, and under "Technical Notes" for CCA on page 14 of [Best Management Practices: For the use of treated wood in aquatic and wetland environments](#). **The ministry will reject any and all treated wood orders that use Interior Douglas-fir.**
- Oilborne preservatives: These are not acceptable for pedestrian handrails installed on a bridge because of their petroleum base, but are acceptable for the common bridge components specified in Tables 1 and 2 of the ministry's [Bridge Timbers and Lumber Material Standard](#). This restriction is consistent with the guidance supplied in the jointly prepared Ministry of Transportation and Infrastructure and FLNR document called, [Guidelines for Use of Treated Wood In and Around Aquatic Environments and Disposal of Treated Wood](#).
- Waterborne preservatives: To improve their corrosion resistance, connectors and fasteners used with CCA and ACZA treated wood should be galvanized in accordance with the specifications on the design drawings.

³ Hem-Fir North is a Canadian subset of Hem-fir that includes Western Hemlock and Pacific silver (amabilis) fir.

⁴ Allowable species must be treated in full accordance with CAN/CSA 080 Series of Standards (includes CSA 080.0, 080.1, 080.2, 080.3, 080.4 and 080.5), including minimum penetration and retention requirements, in accordance with the specified **Use Category** number for specific bridge components and exposures. This will normally be UC4.1 or UC4.2 considered as "Wood for Highway Construction" as per Tables 1 and 2 of the ministry's [Bridge Timbers and Lumber Material Standard](#). **For specific one-off projects, it may be required to treat wood materials to UC5A (marine exposure) where wood materials can be exposed to salt and brackish water to the extent that marine borers can attack them.**

Table 2
Table of Required Documentation Deliverables (as a complete package)
(Note: Not for use with CCA Treated Coastal Douglas-fir Orders)

Supplier's Documentation	Supplier to provide documentation within 30 days of shipment of the treated wood products, and prior to (or at the time of) invoicing, to the following party or parties if indicated 'Yes'		
	Ministry's in-plant quality assurance inspection agency if the treated wood is part of a bridge supply order that includes general in-plant quality assurance inspections performed by the ministry's inspection agency.	Ministry Bridge Engineer responsible for order (as may be specified in the PO or contract)	Ministry HQ Records (FLNREng.Branch@gov.bc.ca)
<ul style="list-style-type: none"> Completed General Statement of Wood Treatment Conformance signed by the third party wood treatment inspector 	<p align="center">Yes if the need for in-plant quality assurance inspections during fabrication is specified</p>	<p align="center">Yes</p>	<p align="center">Yes</p>
<ul style="list-style-type: none"> Copies of all inspection reports prepared by the third party wood treatment inspector 	<p align="center">Yes if the need for in-plant quality assurance inspections during fabrication is specified</p>	<p align="center">Yes</p>	<p align="center">Yes</p>
<ul style="list-style-type: none"> Copies of all penetration and retention test results, and any other related documents prepared by the third party wood treatment inspector or collected by the third party inspector in order to confirm the supplier's adherence to the ministry's Pressure Treated Wood Standard for Timber Deck Bridge Components. 	<p align="center">Yes if the need for in-plant quality assurance inspections during fabrication is specified</p>	<p align="center">Yes</p>	<p align="center">Yes</p>
<ul style="list-style-type: none"> If applicable to the purchase order or contract, a copy of the mill certificate or certificate of origin provided by the supplier specifying "Coastal Douglas-fir" and the geographic location from which the Coastal Douglas-fir was harvested (ensuring that the location is west of the Cascades (USA) or Coast Mountain Range (BC) heights of land) OR A copy of alternative suitable third party documentation (e.g., bill of lading or invoice) provided by the supplier demonstrating that the wood has originated from a Coastal Douglas-fir growing region. 	<p align="center">Yes if the need for in-plant quality assurance inspections during fabrication is specified</p>	<p align="center">Yes if applicable</p>	<p align="center">Yes if applicable</p>

Ministry of Forests, Lands and Natural Resource Operations
General Statement of Wood Treatment Conformance
(Note: Not for use with CCA-Treated Coastal Douglas-fir Orders)

Description of Wood Treatment Order (CCA, ACZA, CR, PCP-A):	
Producer of Treated Wood (give company name and location):	
Ministry Office	Required Delivery Location
Ministry Purchase Order No. or Contract No.	Name of ministry Bridge Engineer (name provided in the purchase order or contract documents)

This is to advise that I am the qualified inspector for this wood treatment order, and I am (check one as appropriate):

- an accredited inspector by **INSERT AGENCY NAME**
- OR
- not an accredited inspector, but qualified by experience and having the minimum qualifications in accordance with the requirements of the Ministry of Forests, Lands and Natural Resource Operations **Pressure Treated Wood Standard for Timber Deck Bridge Components**.

I have personally inspected **STATE NUMBER** treated wood pieces containing **STATE NUMBER** Foot Board Measure (FBM) as manifested in the attached supporting documentation.

I have carried out my inspections of the treatment procedures and processes considered necessary to verify compliance with the applicable requirements of the CSA 080 Series "Wood Preservation" (CSA 080.0, 080.1, 080.2, 080.3, 080.4, and 080.5) **and** Best Management Practices⁵. Based on these inspections, I hereby give my assurance⁶ that, in my opinion the significant aspects of the wood treatment have been carried out in general conformance with the applicable requirements of the CSA 080 Series "Wood Preservation" and Best Management Practices for the order specified wood species and treatment type combinations.

I have undertaken the required penetration and retention testing, and I confirm the results of the testing meet the minimum penetration requirements of CSA 080.2 for sawn lumber products, and preservative retention requirements of Table 10 in CSA 080.1 for the applicable Use Category (UC4.1 or UC4.2 or other) and sawn lumber dimensions.

I have attached copies of the following documentation to this statement: **(1)** all inspection reports; **(2)** all penetration and retention test results and other relevant documentation in order to confirm the supplier's adherence to the standards; and **(3)** the supplier's evidence demonstrating that the treated wood is Coastal Douglas-fir (if applicable).

Signature of Qualified Inspector		<i>(If an "accredited inspector," identify credentials here)</i>
Name of Qualified Inspector <i>(please print)</i>	DATE SIGNED YYYY MM DD 	
EMPLOYER'S NAME AND ADDRESS <i>(please print)</i>		
PHONE NO.	FAX NO.	E-MAIL ADDRESS

⁵ [Best Management Practices: For the Use of Treated Wood in Aquatic and Wetland Environments](#) (Best Management Practices)

⁶ Assurance means that a qualified inspector has undertaken the inspection work at the plant, which in his or her judgement, is considered necessary to ascertain whether the significant aspects of the wood treatment are in general conformance with the applicable requirements of the CSA 080 Series "Wood Preservation" and Best Management Practices for the specified wood species and treatment type combinations.