FLNRO Standards for Bridge Timbers and Wood Treatment

Glenn Moore & Brian Chow
FLNRORD Engineering Branch - Victoria
Webinar January 8, 2020
11:00 am – 12:00 pm
FLNRO Development of Standards for LUMBER and treated Wood Materials

Currently observing challenges with conformance to ministry standards:

- Lumber standard not always being enforced
  - Lumber quality verification
    - Grade stamping versus Certificate of Inspection
- Treatment standards not always being enforced, and confusion on treatment standards and options
  - No or improper documentation supplied
  - 3rd party wood treatment inspection and results not provided
  - Coastal vs Interior Douglas-Fir for CCA treatment
Presentation Outline

Review of:

1. **Bridge Timbers and Lumber Material Standard**
   - allowable untreated and treated wood species, as specified for different bridge components
   - specification of the Use Category (UC4.1 or UC4.2) for treated wood
   - grade stamping for timber quality verification *versus* Certificate of Inspection in lieu of grade stamped lumber
Presentation Outline

Review of:

2. **Pressure Treated Wood Standard for Timber Deck Bridge Components**

   - 4 types of allowable preservatives: chromated copper arsenate Type C (CCA); ammoniacal copper zinc arsenate (ACZA); creosote (CR); and pentachlorophenol in type A oil (PCP-A)
   - Wood species, allowable preservatives, treatment specifications
   - Coastal vs Interior Douglas-Fir

3. **Q & A / discussion**
FLNRO Development of Standards for LUMBER and treated Wood Materials

Challenges at the time (2009ish):

- Limited reference to standards for lumber and for treated wood
- Referenced conformance to CAN/CSA-080 “Wood Preservation” as a general ‘catch-all’
- No checks for quality assurance for lumber or for treated wood; no 3rd party verification of treatment results
- Wanted requirements that could be supplied from BC

Possibly received wood materials of questionable quality, and where preservative treatment was specified the treated wood supplied may have consisted of only ‘dip treatment’
FLNRO Development of Standards for LUMBER and treated Wood Materials

Objectives to remedy challenges:

• consistent quality timber materials; meet Canadian Lumber Standards
• industrial quality treated wood that will provide long term performance for the intended use
• conform to CSA-080 Series “Wood Preservation”, and Best Management Practices
• require quality assurance for lumber and for treated wood

To establish standards that provide for performance and service life expectancy, and to establish a level playing field for suppliers
FLNRO DEVELOPMENT OF STANDARDS FOR LUMBER AND TREATED WOOD MATERIALS

• FSR bridge design and construction standards include standards for lumber and treated wood materials:
  o Bridge Timbers & Lumber Material Standard
  o Pressure Treated Wood Standard for Timber Deck Bridge Components
    ▪ Process Specification for CCA Treatment of Coastal Douglas-fir Wood

https://www2.gov.bc.ca/gov/content/industry/natural-resource-use/resource-roads/engineering-standards-guidelines/bridge-design-construction/material-standards
FLNRO BRIDGE TIMBERS & LUMBER MATERIAL STANDARD

Key requirements for lumber:

- Rough lumber material
- Conforming to various wood species depending on bridge component
- Lumber graded in accordance with NLGA grading rules
  - Lumber grade is related to structural characteristics
  - No. 1 grade for cross-ties and stringers
  - No. 2 grade for all other timber components
- All rough lumber to be:
  - Full sawn
  - Trimmed for removal of sniped, splintered, or uneven lengths
  - Trimmed full to length (tolerances specified), and double-end trimmed
- Lumber quality (applied grading rule, grade, wood species) verified by:
  - grade stamp or
  - Certificate of Inspection, prepared by Accredited Grading Agency
**FLNRO BRIDGE TIMBERS & LUMBER MATERIAL STANDARD**

### Table 1

**Lumber species and grade requirements for standard timber deck bridges**

(Except components for 6.1 m span “All Timber Portable Bridge” as noted in attached Table 2)

<table>
<thead>
<tr>
<th>Bridge Component</th>
<th>Allowable Untreated Lumber Species</th>
<th>Allowable Lumber Species and Use Category if Treated (Refer to Pressure Treated Wood Standard for Timber Deck Bridge Components)</th>
<th>Required Lumber Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timber guardrail, riser blocks and brackets (e.g., untreated 250 mm x 250 mm size)</td>
<td>• D Fir-L (preferred) • Hem-Fir North or SPF West (if justified by life cycle cost analysis for site-specific crossing)</td>
<td>• Coastal D-Fir • Hem-Fir North</td>
<td>No. 2 or better (e.g., NLGA Para. 131c – “No.2” – Structural Posts and Timbers for 250 mm x 250 mm size)</td>
</tr>
<tr>
<td>Timber deck running planks (wear planks) (e.g., untreated 75 mm x 250 mm size for wear planks to sub-deck; e.g., untreated 100 mm x 300 mm size for wear planks to cross-ties)</td>
<td>• D Fir-L (preferred) • Hem-Fir North or SPF West (if justified by life cycle cost analysis for site specific crossing)</td>
<td>Not treated (because mechanical wear is the life limiting factor rather than rot)</td>
<td>No. 2 or better (e.g., NLGA Para. 124c – “No.2” - Structural Joists &amp; Planks for 75 mm x 250 mm size)</td>
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<tr>
<td>Timber sub-deck planks (e.g., 100 mm x 300 mm for sub-deck planks to cross-ties)</td>
<td>• D Fir-L</td>
<td>• Coastal D-Fir • Hem-Fir North</td>
<td>No. 2 or better (e.g., NLGA Para. 124c – “No.2” - Structural Joists &amp; Planks for 100 mm x 300 mm size)</td>
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<tr>
<td>Timber cross-ties (e.g., 200 mm x 200 mm, 200 mm x 250 mm, 200 mm x 300 mm, 250 mm x 300 mm size, etc.)</td>
<td>• D Fir-L</td>
<td>• Coastal D-Fir</td>
<td>No. 1 or better (e.g., NLGA Para. 131b – “No.1” – Structural Posts and Timbers for 200 mm x 200 mm size, 200 mm x 250 mm size or 250 mm x 300 mm size)</td>
</tr>
<tr>
<td>Ballast wall timbers (e.g., treated 150 mm x 300 mm size)</td>
<td>None. Must treat ballast wall timbers</td>
<td>• Coastal D-Fir</td>
<td>No. 2 or better (e.g., NLGA Para. 130c – “No.2” – Structural Beams and Stringers for 150 mm x 300 mm size)</td>
</tr>
<tr>
<td>Timber sills (e.g., treated 200 mm x 400 mm, 305 mm x 305 mm, etc.)</td>
<td>None. Must treat timber sills</td>
<td>• Coastal D-Fir</td>
<td>No. 2 or better (e.g., NLGA Para. 130c – “No.2” – Structural Beams and Stringers for 200 mm x 400 mm size)</td>
</tr>
</tbody>
</table>

**Use Category UC4.1**

**Use Category UC4.2**
• Different wood species have different strength characteristics
• Therefore different species specified depending on deck component type and whether wood treatment is specified
• No species or grade substitutions

Table 9.13 from CSA S6-14
**D FIR-L GROWING REGION**

Species Combination: Douglas Fir-Larch  
Abbreviation: D.Fir-L or DF-L

<table>
<thead>
<tr>
<th>Species Included in Combination</th>
<th>Growth Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Douglas Fir</td>
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<tr>
<td>Western Larch</td>
<td></td>
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</tbody>
</table>

D Fir-L includes Coastal Douglas-fir, Interior Douglas-fir, and Western Larch.
COASTAL D-FIR GROWING REGION


As depicted in the ‘pink’ coloured polygons, Coastal D-Fir grows:

- on Vancouver Island,
- along Coastal BC, in a fringe bordered roughly by Bella Coola to the north, and inland by Chilliwack and Abbotsford, as far north east as Yale, and south of Whistler. Beyond these boundaries, there are transitional zones between Coastal D-Fir and Interior D-Fir. For example, closer to Merritt, there are both transitional fir zones and Interior D-Fir, and
- along the coast of Washington and Oregon.
HEM-FIR NORTH GROWING REGION

Species Combination: Hem-Fir
Abbreviation: Hem-Fir or H-F

<table>
<thead>
<tr>
<th>Species Included in Combination</th>
<th>Growth Region</th>
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</thead>
<tbody>
<tr>
<td>Pacific Coast Hemlock</td>
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<tr>
<td>Amabilis Fir</td>
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</tbody>
</table>

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

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<thead>
<tr>
<th>Species Included in Combination</th>
<th>Growth Region</th>
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<tbody>
<tr>
<td>White Spruce</td>
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<td>Engleman Spruce</td>
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<td>Red Spruce</td>
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<td>Black Spruce</td>
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<td>Jack Pine</td>
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<td>Lodgepole Pine</td>
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<tr>
<td>Balsam Fir</td>
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<tr>
<td>Alpine Fir</td>
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</tbody>
</table>

_Species Combination: Spruce-Pine-Fir_  
_Abbreviation: S-P-F_

_Spruce-Pine-Fir West (SPF West) is a Western Canadian subset of Spruce-Pine-Fir that includes Engelmann Spruce, Western White Spruce, Lodgepole Pine, and Alpine Fir._
9.11.1.3 Identification of wood

All wood shall be identified by a grade stamp or certification of an association or independent grading agency approved by the Canadian Lumber Standards Accreditation Board as specified in CSA O141. When it is possible that preservative treatment could obscure the grade stamp, a certificate of inspection or other evidence of grade approved by the engineer shall be supplied by the treating company.

Reference: CSA S6-14 & 19
CLSAB Accredited Agencies

Alberta Forest Products Association
Canadian Mill Services Association
Canadian Softwood Inspection Agency
Central Forest Products Association
Council of Forest Industries
Maritime Lumber Bureau
Newfoundland and Labrador Lumber Producers' Association
OFIA Home of CLA Grading and Inspection
Ontario Lumber Manufacturers' Agency
Pacific Lumber Inspection Bureau
Quebec Forest Industry Council

Council of Forest Industries

The Council of Forest Industries (COFI) is the voice of the BC interior forest industry. COFI companies operate 100 production facilities in more than 60 forest-dependent communities in the interior of British Columbia. COFI member company operations account for approximately 80 percent of all BC softwood lumber shipments and 35 percent of Canadian softwood lumber shipments. COFI is a CLSAB-accredited Lumber Grading Agency.

Council of Forest Industries
250 - 1855 Kirschner Road
Kelowna, BC
Canada, V1Y 4N7

Tel: 250-860-9683
Fax: 250-860-0009
Web: www.cofi.org

Accredited to supervise:
- Visually Graded Lumber
- Fingerjoined Lumber
- Machine-Graded Lumber
Lumber Grade Stamps

Grading agency
Mill designation
Species group
Moisture content
Assigned Grade

Lumber Quality Verification

Grade·Stamped·Lumber

13.-For verification of lumber quality, each piece of rough lumber must be marked with a certified grade stamp issued by the accredited Grading Agency, showing as a minimum the:

a. registered symbol of the certified agency (i.e., accredited Grading Agency)
b. mill and/or grader identity usually by number
c. grading rule used where applicable
d. grade
e. condition of seasoning
f. species or species group
American Lumber Standard Committee, Incorporated

Pacific Lumber Inspection Bureau (PLIB)
909 South 336th Street
Suite 203
Federal Way, WA 98003

1. Approval as an inspection agency including mill supervisory service under:
   a. WCLIB rules
   b. WWPA rules
   c. RIS rules
   d. NLGA rules
2. Approved to supervise glued and machine graded lumber.
3. Approved to provide heat treatment audit services under all rules.

Canadian Mill Services Association (CMSA)
#200, 601-6th Street
New Westminster, BC V3L 3C1

1. Approved as an inspection agency including mill supervisory service under:
   a. NLGA rules
   b. NGR portion of WWPA rules for Douglas fir, larch, and SPF(S)
2. Approved to supervise glued and machine graded lumber.
3. Approved to provide heat treatment audit services under all rules.

Canadian Softwood Inspection Agency, Inc. (CSI)
MacDonald Inspection Services (MI)
403-20238 Fraser Highway
P.O. Box 61599
Langley, BC V3A 4E6

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Certificate of Inspection

[Image of Certificate of Inspection]

[Image of Canadian Mill Services Association Certificate of Inspection]

[Image of Ministry of Forests, Lands, Natural Resource Operations and Rural Development]
Recent Non-conformance Situation

1. A ministry order for non-treated timber deck modules and loose timbers did not expressly specify that a Certificate of Inspection was acceptable for lumber quality verification purposes in lieu of grade stamped lumber.

2. Grade stamping was not carried out by the supplier. Instead, after the supplier shipped the wood products, it provided unsatisfactory lumber quality verification letters to the ministry titled “Quality Control Grade Declaration” signed by the mill.

3. The ministry rejected the supplier’s letters, and requested the supplier to retain a CSLAB Accredited Agency at the supplier’s cost to inspect the supplied wood products for quality verification.

4. The CSLAB Accredited Agency determined some pieces were off grade in a few timber deck module panels, and the supplier was requested to rectify deficiencies at its cost.
Pressure Treated Wood Standard for Timber Deck Bridge Components
Why do we have Treated Wood Standards?

1. To produce a consistent, industrial quality, treated wood that will provide long term performance for the intended use & exposure condition.

2. To meet CSA 080 Standards for Wood Preservation, including its ‘results based’ criteria for retention and penetration.

3. To meet Best Management Practices to protect the environment.

4. To require quality assurance with 3rd party inspection of process, and testing of preservative retention & penetration to gauge against CSA 080 results based criteria.
Why do we have Treated Wood Standards?

5. To establish standards for suppliers that will create a level playing field.

6. Properly preservative-treated wood can have 5 to 10 times the service life of untreated wood. This extension of life saves the equivalent of 12.5% of Canada’s annual log harvest.

Source: Canadian Wood Council
http://cwc.ca/design-with-wood/durability/pressure-treated-wood/

7. Wood products treated in accordance with CCA 080 Series of Standards are expected to significantly outlast untreated wood.
• Chemicals are used to treat wood (the chemicals react with the wood)

• Chemicals make wood unattractive to wood-rotting fungi and insect pests like borers & termites

• Typically:
  • Specify galvanized steel where bare steel would rust;
  • **Similarly,** specify treated wood where it will be used in a setting conducive to decay and insect attack
Incising improves the penetration into impermeable wood by making a series of small, shallow slits cut into the wood by an incising machine.
Overview of CSA 080 Series Standards for Wood Preservation

1. Series of 5 standards (specifications; processing, sampling and results requirements; preservative formulations; solvents; and chemical additives)

2. Gives technical specification requirements based on a “Use Category System” (UCS)

3. UCS is designed to match level of treatment to decay/termite risk by matching the:
   - wood species
   - preservative type
   - preservative penetration, mm
   - preservative retention (loading) e.g., kg/m³
Best Management Practices: For the use of treated wood in aquatic and wetland environments:
http://preservedwood.org/portals/0/documents/BMP.pdf

- Provides:
  - BMP quality assurance procedures
  - specific recommendations for each preservative type
  - processes to minimize mobility of preservative (e.g., CCA fixation)
  - processes to maximize cleanliness of wood surface
  - guidelines for installation and maintenance
Guidelines for Use of Treated Wood In and Around Aquatic Environments and Disposal of Treated Wood:

## UC4.1 (hazard class)

Product for highway construction, above ground, exterior use for bridge construction

### Table 1

<table>
<thead>
<tr>
<th>Use category</th>
<th>Service conditions</th>
<th>Use environment</th>
<th>Common agent(s) of deterioration</th>
<th>Typical application(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UC1</td>
<td>Interior construction — above ground — dry</td>
<td>Protected against weather and other sources of moisture</td>
<td>Insects</td>
<td>Interior construction and furnishings</td>
</tr>
<tr>
<td>UC2</td>
<td>Interior construction — above ground — damp</td>
<td>Protected against weather, but can be exposed to moisture</td>
<td>Decay fungi and insects</td>
<td>Interior construction</td>
</tr>
<tr>
<td>UC3.1</td>
<td>Exterior construction — above ground — coated and rapid water run off</td>
<td>Protected against weather by coating or cladding and not subject to prolonged wetting</td>
<td>Decay fungi, disfiguring fungi, and insects</td>
<td>Coated millwork, siding, and trim</td>
</tr>
<tr>
<td>UC3.2</td>
<td>Exterior construction — above ground — uncoated or poor water run off</td>
<td>Exposed to all weather cycles, including prolonged wetting</td>
<td>Decay fungi, disfiguring fungi, soft-rot fungi, and insects</td>
<td>Decking, deck joists, railings, fence pickets, and uncoated millwork</td>
</tr>
<tr>
<td>UC4.1</td>
<td>Ground contact or freshwater — non-critical components</td>
<td>Exposed to all weather cycles; normal exposure conditions, including salt water splash*</td>
<td>Decay fungi, disfiguring fungi, soft-rot fungi, and insects</td>
<td>Fence, deck, and guardrail posts, cross ties, and utility poles (low-decay areas)</td>
</tr>
<tr>
<td>UC4.2</td>
<td>Ground contact or freshwater — critical structural components or difficult replacement</td>
<td>Exposed to all weather cycles; high potential for decay</td>
<td>Decay fungi, disfiguring fungi, soft-rot fungi, and insects (with increased potential for biodeterioration)</td>
<td>Land, freshwater, and foundation piles, permanent wood foundations, building poles, horticultural posts, cross ties, and utility poles (high-decay areas)</td>
</tr>
<tr>
<td>UCSA</td>
<td>Coastal waters — brackish water or salt water and adjacent mud zone</td>
<td>Continuous salt water exposure</td>
<td>Salt water organisms</td>
<td>Piles, bulkheads, and bracing</td>
</tr>
</tbody>
</table>
CCA: Copper is the primary fungicide, arsenic is a secondary fungicide and an insecticide, and chromium is a fixative which also provides UV resistance.

<table>
<thead>
<tr>
<th>Allowable Preservative Treatment Types (Note: FLNR will specify required treatment type in a purchase order or contract document)</th>
<th>Allowable Wood Species for Treatment</th>
<th>Required Treatment Standard</th>
<th>Bridge Components, Wood Species, and Use Category Combinations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Oilborne Preservatives</strong>&lt;br&gt;Creosote (CR)&lt;br&gt;Pentachlorophenol in type A oil (PCP-A)</td>
<td>Coastal D-Fir&lt;br&gt;Hem-Fir North³</td>
<td>Meet or exceed CAN/CSA 080 Series “Wood Preservation”³ in effect and applicable at the time of treatment</td>
<td>Only in US!</td>
</tr>
<tr>
<td><strong>Waterborne Preservatives</strong>&lt;br&gt;Chromated copper arsenate, Type C (CCA)</td>
<td>Coastal D-Fir</td>
<td>Apply FLNR’s process specification for CCA treatment called, <em>Interim Process Specification for CCA Treatment of Coastal Douglas-fir Wood</em></td>
<td>See Table 1 or 2 (as applicable) of <em>Bridge Timbers and Lumber Material Standard</em></td>
</tr>
<tr>
<td>Ammoniacal copper zinc arsenate (ACZA)</td>
<td>Coastal D-Fir&lt;br&gt;Hem-Fir North</td>
<td>Meet or exceed CAN/CSA 080 Series “Wood Preservation” in effect and applicable at the time of treatment</td>
<td></td>
</tr>
</tbody>
</table>
Background history behind development of process based CCA treatment specification

Evaluated wood treatment options:

Oil Borne:
- Creosote (CR)
- Pentachlorophenol in Type A Oil (PCP-A)

Water Based:
- Ammoniacal Copper Zinc Arsenate (ACZA)
- Chromated Copper Arsenate, Type C (CCA)

Desired criteria:
- An economical waterborne preservative
- Treatment type readily available in BC
- Treatment to be effective with D-Fir
- 3rd party inspection
Background history behind development of process based CCA treatment specification

- Focussed on CCA:
  - Economical
  - Less environmental “baggage”
  - Fewer implications for handling
  - Readily available within BC
  - Best option considering alternatives
  - Better than what we had at the time
  - Worth an attempt

Recognized that not likely to attain CSA-080 Series results for penetration (and sometimes for retention) - thus

**Ministry decision to move forward with development of a process based specification for CCA treatment of Coastal Douglas-fir**
CCA is not recommended for treatment of Interior Douglas-fir

“CCA is considered an excellent treatment for most softwood species. Achieving the required penetrations in Douglas-fir may be extremely difficult. CCA is not recommended ... for treatment of interior Douglas-fir.”

Reference: Page 14 of Best Management Practices: For the use of treated wood in aquatic and wetland environments:
http://preservedwood.org/portals/0/documents/BMP.pdf
CCA is not recommended for treatment of Interior Douglas-fir

Table 6 of CSA 080

<table>
<thead>
<tr>
<th>Species</th>
<th>UC1 and UC2</th>
<th>UC3</th>
<th>UC4.1</th>
<th>UC4.2</th>
<th>UC5A</th>
<th>Permanent wood foundations</th>
<th>Shakes and shingles</th>
<th>Sawn</th>
<th>Highway bridges</th>
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<tbody>
<tr>
<td>Pines</td>
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<td>Hemlocks, true firs, and spruces</td>
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<td>Spruce-Pine-Fir West</td>
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<td>Beech</td>
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</tbody>
</table>
Description of FLNRO CCA Process Specification

- 3<sup>rd</sup> party Quality Assurance (QA) inspection required
  - Inspections at the treatment plant to verify conformance with process specification
  - Tests of preservative retention and penetration
- Documentation requirements:
  - Inspection reports of CCA Process
    - record of pressure treatment and treating cycle summary
    - record of retention and penetration test results
  - Statement of CCA Treatment Process Conformance
  - Letter specifying log source for Coastal D-Fir
CSA-080 Compared to Retention Results

- Ref. CSA-080.1-15 (Table 10)
- Preservative retention requirements depend on
  - preservative type
  - UC #
  - wood species
- Coastal D-Fir, UC4.1, CCA
  - 0.4 lb/ft³ = 6.4 kg/m³

Test results from ministry orders indicate that process specification results in meeting or exceeding the retention requirements of CSA-080
CSA-080 Compared to Penetration Results

Ref. CSA-080.2-15 (Table 5)

- # required test borings depend on - wood species, product thickness & preservative type
- CCA treated Coastal D-Fir need:
  - minimum of 20 boring samples per charge
  - 16 of 20 borings (80%) must meet penetration requirement

---

Table 5

Minimum penetration requirements for sawn products*
(See Clauses 9.1.8.1, 9.1.10.4, and 9.7.3.1 and Tables 8, 9, 11, and 13 to 15.)

<table>
<thead>
<tr>
<th>Species</th>
<th>Incising‡</th>
<th>Penetration depth†</th>
<th>Number of borings required</th>
<th>Percentage of borings required to meet penetration requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coastal Douglas fir</td>
<td>Required</td>
<td>Products &lt; 114 mm thick: 10 mm and 90%, Products ≥ 114 mm thick: 13 mm and 90%</td>
<td>Products All Marine (UC5A): 13 mm and 90%, CR, CR-S, and CR-PS: 48</td>
<td>All other preservatives: 20, CR: 80</td>
</tr>
</tbody>
</table>

*See details in Clause 9.1.8.1, 9.1.10.4, and 9.7.3.1 and Tables 8, 9, 11, and 13 to 15.

†Penetration depth refers to the minimum required penetration for the specified products and species.
‡Incising requirements vary by species and product type.
Penetration Test Results Using FLNRO CCA Process Specification for Coastal D-Fir

2013-2018 Results for Coastal D-Fir - % of total results greater or equal than a particular penetration depth (1700 Borings)

2009-2011 Results for Coastal D-Fir - % of total results greater or equal than a particular penetration depth (428 Borings)

2009-2011 Results for Interior D-Fir - % of total results greater or equal than a particular penetration depth (120 Borings)

13 mm for ≥ 114 mm thick
Considerations to Address Delivery Concerns of Treated Wood Orders

1. Continue to work with contract timber and treatment suppliers to make sure they understand the standards and expectations.
   - Prior to award of purchase order/contract, discuss requirements of order with the low bidder to confirm understanding of the ministry standards for lumber and treated wood materials. This will help to avoid order problems.
   - Review requirements in detail particularly with any new supplier that has not successfully supplied previously to the ministry.

2. Encourage ordering of treated timber deck / misc. wood well in advance because:
   - there are no stock piles of industrial treated wood, and
   - wood has to be ordered, then fitted into a treatment schedule at the treating plant.
Considerations to Address Delivery Concerns of Treated Wood Orders

3. Possibly pre-order Coastal D-Fir, get it treated locally by a treater that can meet the FLNRO treatment standards, store in ministry yard, ready as a source of material for assembly or use in the future

4. Possibly pre-order fully assembled, treated timber deck modules, and store in yard

5. Possibly combine bulk orders from various business areas.