

PART I

TREATABILITY OF INCISED CANADIAN WESTERN SPF WITH ACQ-C (NW₁₀₀)

Craig A. Wilson^a and Dave Alexander^b

^a: Timber Specialties Co., 35 Crawford Crescent, Campbellville, Ontario, L0P 1B0; Canada

^b: D.L. Alexander & Associates, 114 Chartwell Crescent, Beaconsfield Qc.

Summary

An evaluation of the treatability of incised Western SPF lumber with ACQ-C (NW₁₀₀) was carried out at an eastern Canadian treating facility. The study compared the NW₁₀₀ treatment quality of end matched Western SPF lumber, half incised by a Western Wood Preserving (WWP) facility, and half incised by an eastern Canadian treating facility (ECTF). The results of the study showed that a higher quality of treatment was achieved in the ECTF incised lumber when compared to the WWP incised lumber. The ECTF incised lumber resulted in deeper NW₁₀₀ penetrations and higher NW₁₀₀ assay retentions due to deeper incisions and higher incision densities. The details of the study are summarized below:

Methodology

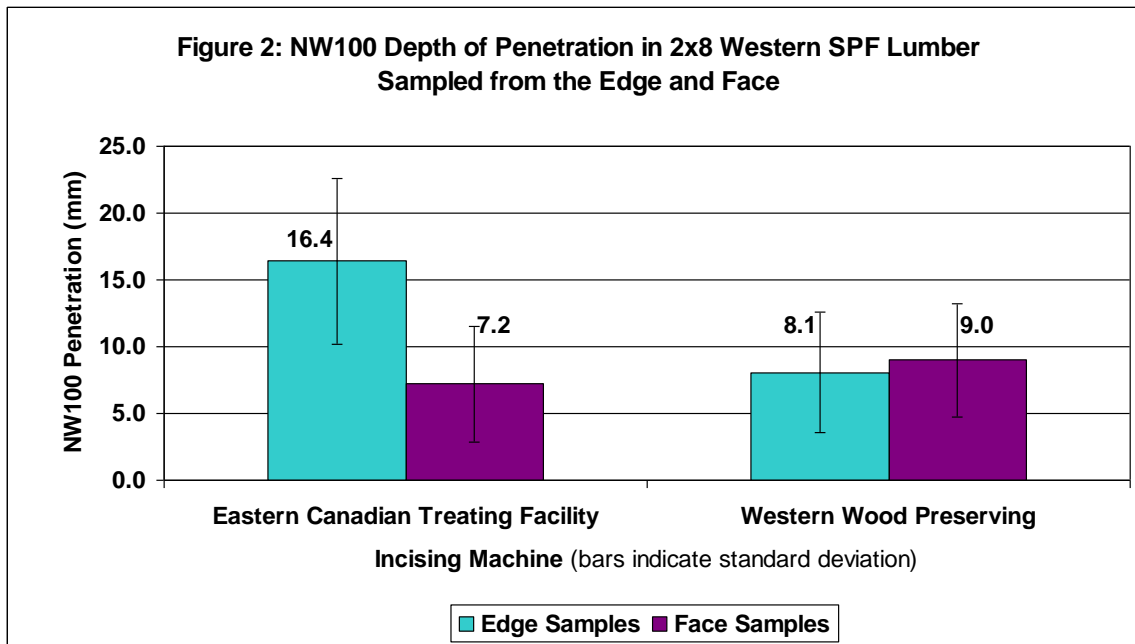
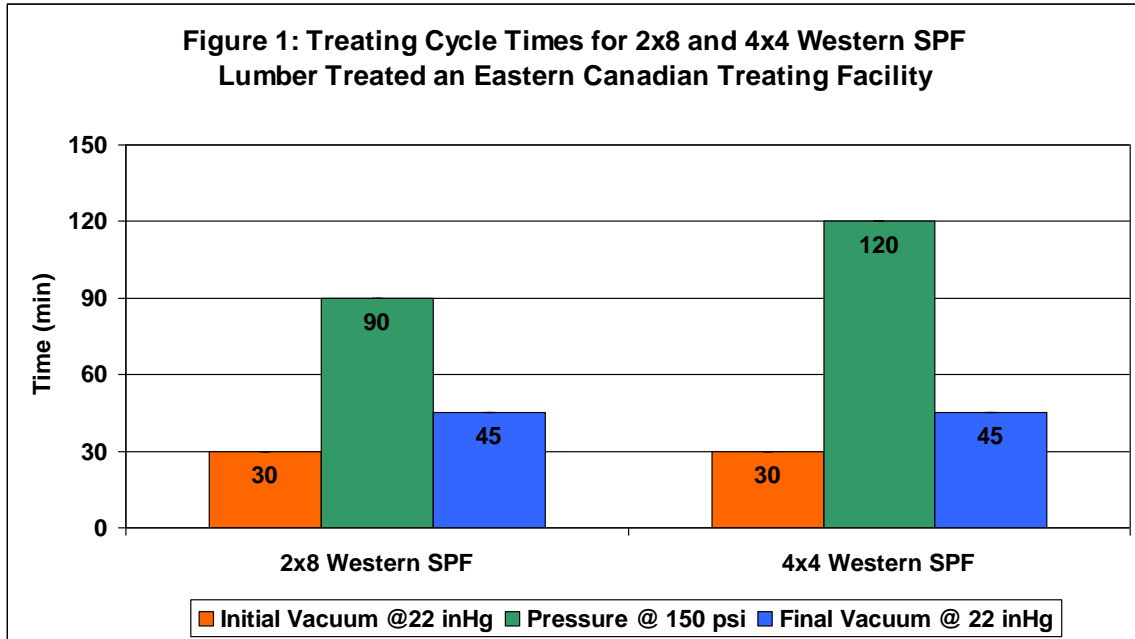
Sixteen-foot-long Western SPF lumber (84 pieces of 2x8, and 35 pieces of 4x4) were purchased from a sawmill in Cochrane, AB, and cut into matching eight feet sections. Species determination showed that the 2x8 lumber contained 25% pines while the 4x4 lumber contained 56% pines. Half of the lumber was shipped to WWP for incising on their RJH Enterprises (formally L&M) incisor, while the other half was shipped to the ECTF facility for incising on their ProTim incisor. After incising at WWP, the lumber sections were shipped to ECTF for comparison treatments with NW₁₀₀.

A count of the incisions resulted in 8,959 / m² and 9,688 / m² for ECTF incised 2x8 and 4x4 lumber, respectively. While incisions densities of 6,464 / m² and 8,525 / m² were determined for the WWP incised 2x8 and 4x4 lumber, respectively. A lower incision density was recorded for the WWP incised 2x8 because of spacing gaps on the surface of the lumber (see Photo 1 in Appendix 1).

Figure 1 shows the initial vacuum, pressure, and final vacuum times for the 2x8 and 4x4 Western SPF lumber charges treated at ECTF. Both end matched bundles of the 2x8 and 4x4 lumber were included with the treatment of two charges of 2x12 Western SPF lumber using a 2% NW₁₀₀ solution concentration. Each piece of the 2x8 and 4x4 lumber was immediately sampled after treatment for determination of penetration and assay retention in accordance with the CSA O80.2 standard and the proposed CSA O80.32-YY residential standard.

The 2x8 lumber were sampled at mid length, by first randomly taking twenty borings from the edge of each bundle, and then by taking borings through the face of each piece. The 4x4 lumber were sampled at mid length by first selecting the pith face and then taking borings from each piece. All borings were sprayed with a Heartwood/Sapwood Indicator and Copper Indicator before measuring

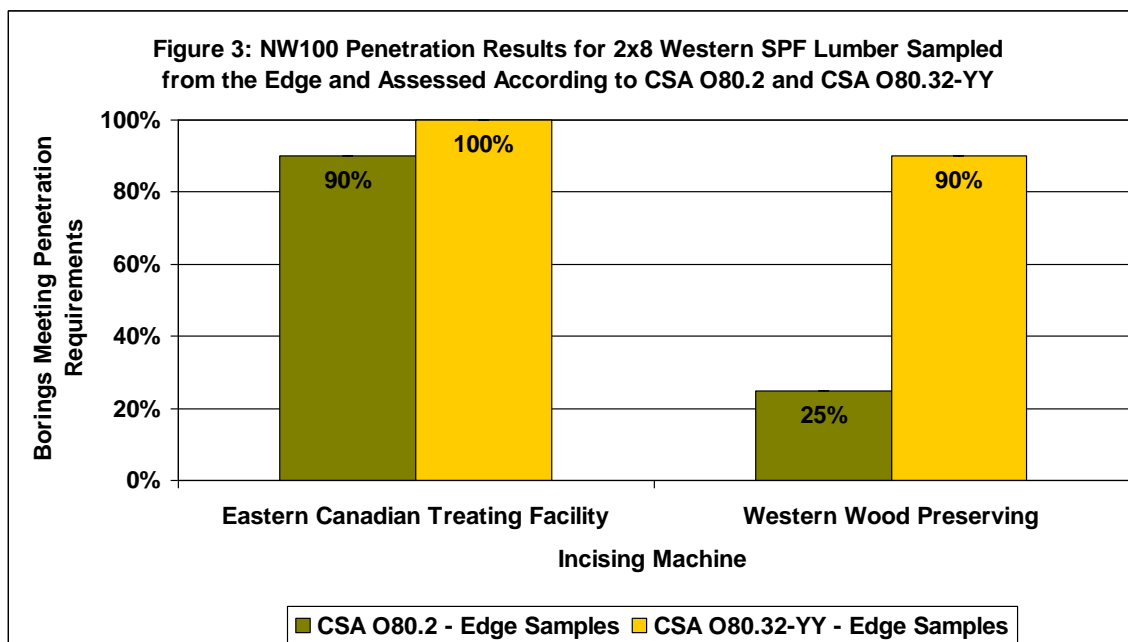
the depth of copper penetration. Borings were then photographed before cutting to the 16 mm assay zone and sending to Timber Specialties for NW₁₀₀ analysis.



2x8 Results

Figure 2 shows the average depth of NW₁₀₀ penetration in the 2x8 lumber sampled from the edge and face. The ECTF incised lumber resulted in edge penetrations that were 103% deeper than in the WWP incised lumber. There were no significant differences (0.05 significance level) in the depth of NW₁₀₀ penetrations for the face samples although on average the WWP incised lumber resulted in 25% deeper penetrations than the ECTF incised lumber.

Figure 3 shows that the ECTF incised 2x8 lumber passed the penetration requirements of both the CSA O80.2 and the proposed CSA O80.32-YY* standards with greater than 80% of borings meeting the minimum requirements. The CSA O80.2 standard required 10mm penetration while the proposed CSA O80.32-YY Standard required 5mm of penetration. Both standards also required 85% sapwood penetration. Approximately 90% and 100% of the edge borings met the 10 mm and 5 mm minimum penetration requirements of CSA O80.2 and CSA O80.32-YY, respectively. The WWP incised lumber failed to meet the penetration requirements of CSA O80.2 with only 25% of the borings meeting the 10 mm penetration requirement. However, with 90% of the borings meeting the 5 mm penetration requirement, the WWP incised lumber met the penetration requirement of the proposed CSA O80.32-YY standard.



*Note: the proposed O80.32-YY Standard was approved and added to CSAO80-97as a supplement in March 2005. The standard is entitled Preservative Treatment of Decking Lumber with Water-borne Preservatives by Pressure Processes.

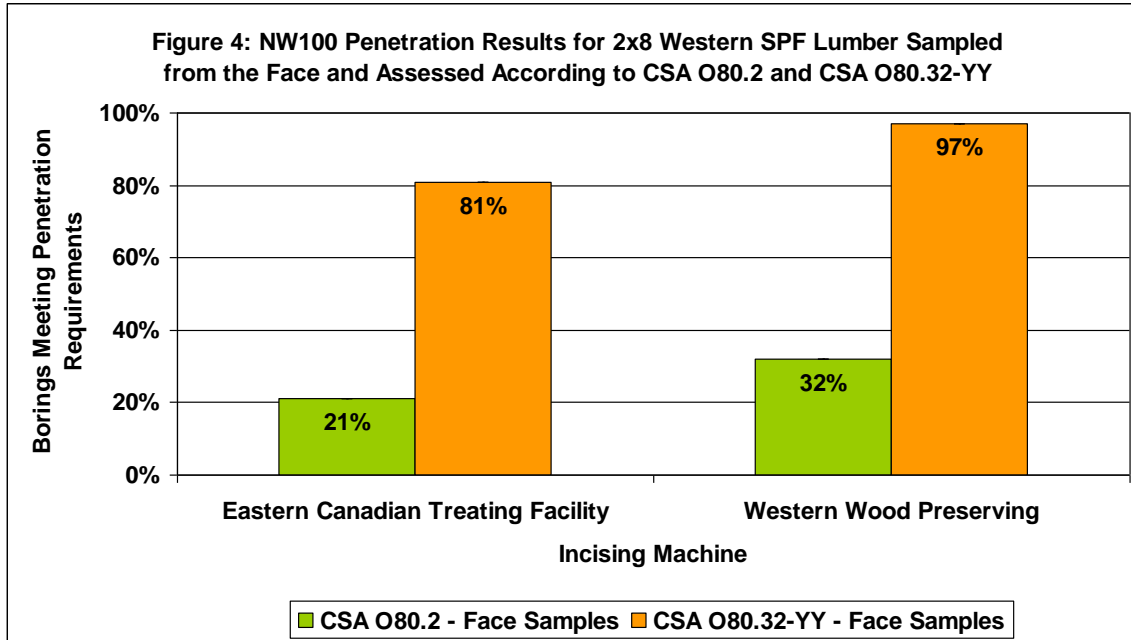
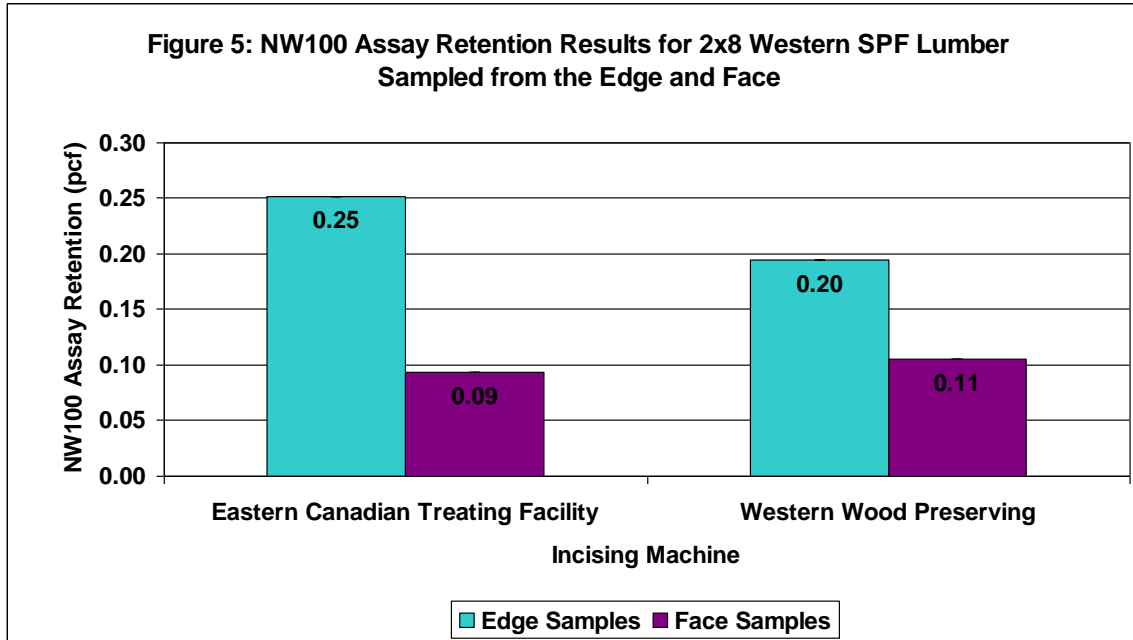


Figure 4 shows that the face borings of both the ECTF and WWP incised 2x8 lumber failed to meet the penetration requirements of CSA O80.2. However, when assessed according to the proposed CSA O80.32-YY standard, 81% and 97% of the face borings met the 5 mm penetration requirement of the standard for the ECTF and WWP incised material, respectively.

The assay retention results for the edge and face borings taken from the ECTF incised and WWP incised 2x8 lumber are shown in Figure 5. Only the edge borings from the ECTF incised lumber met the 0.25 pcf assay retention requirement of both CSA standards. On average the ECTF incised lumber resulted in 25% higher assay retention in the edge borings, but 22% lower assay retention in the face borings when compared to the WWP incised lumber.

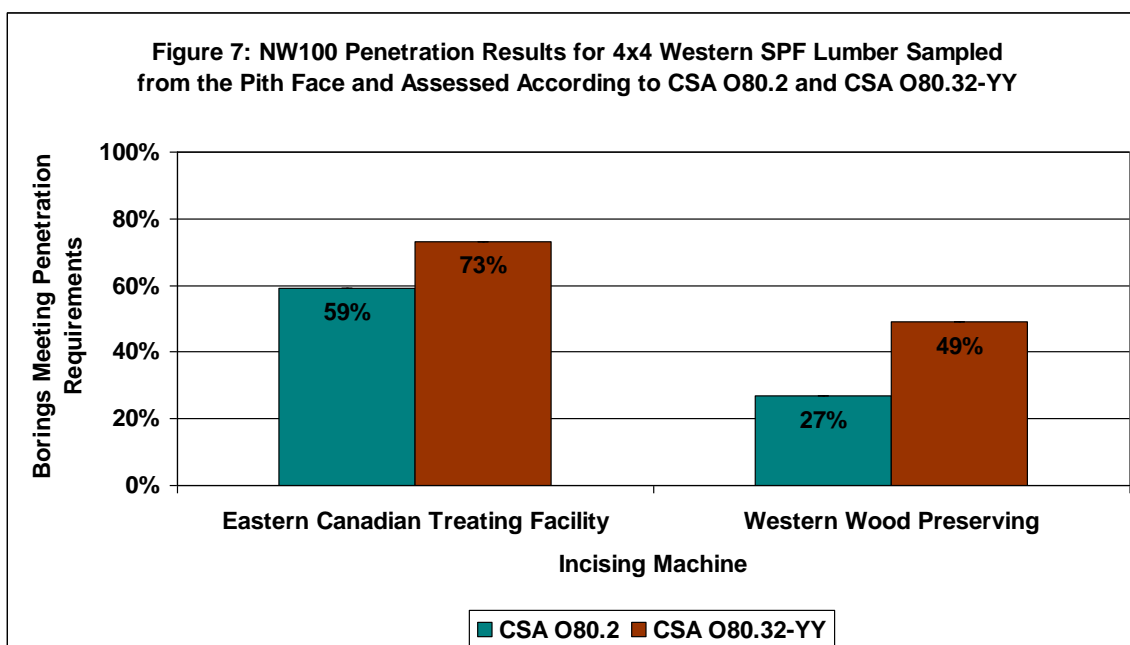
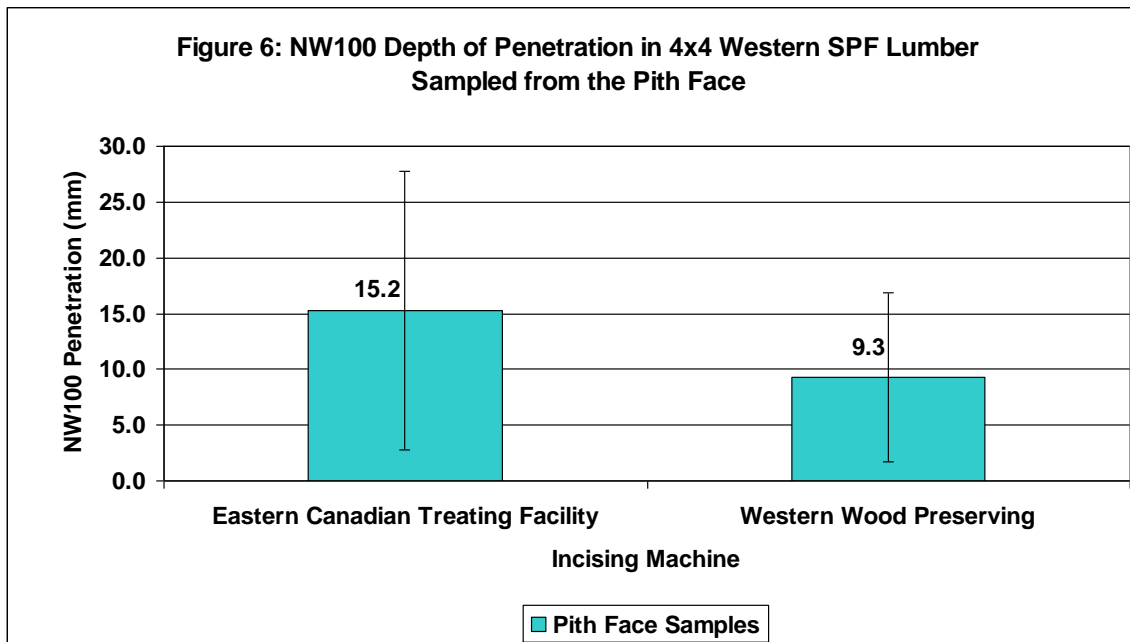


4x4 Results

Figure 6 shows the average depth of NW₁₀₀ penetration in the 4x4 lumber sampled from the pith face. Although there were no significant differences (0.05 significance level) in the depth of penetration for the ECTF incised and WWP incised lumber, the ECTF incised lumber resulted in NW₁₀₀ penetrations that were on average 63% deeper than the WWP incised lumber.

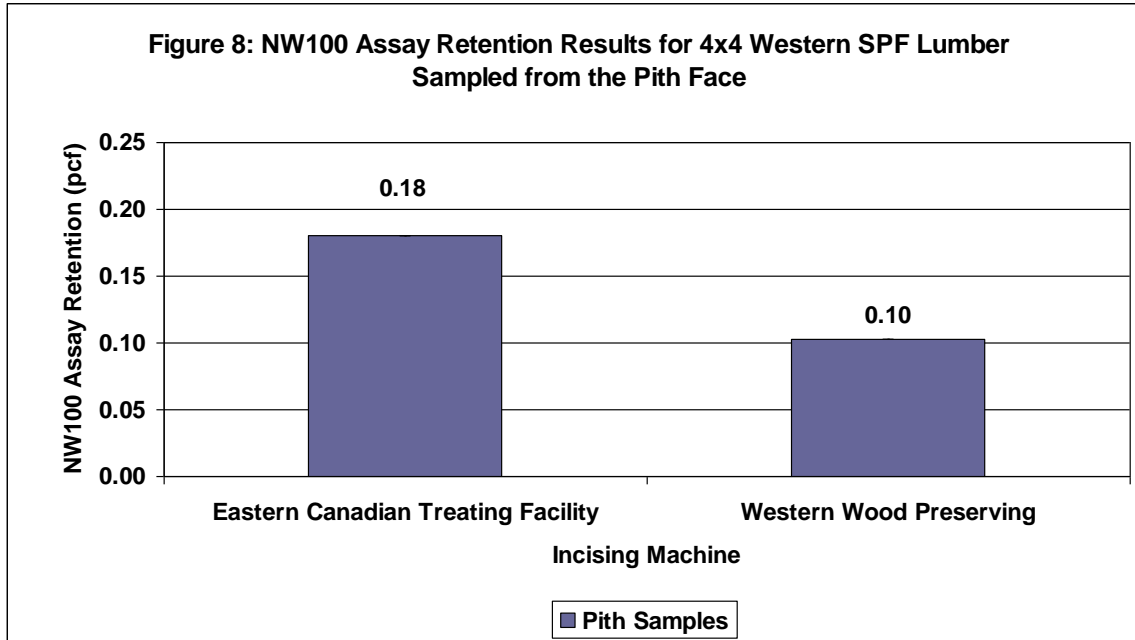
Figure 7 shows that both the ECTF and WWP incised 4x4 lumber failed to meet the penetration requirements of CSA O80.2 and the proposed CSA O80.32-YY standards with less than 80% of borings meeting the minimum requirements. Only 59% of the ECTF incised lumber and 27% of the WWP lumber met the 10 mm penetration requirement of CSA O80.2. Only 73% of the ECTF incised lumber and 49% of the WWP lumber met the 8 mm penetration requirement of CSA O80.32-YY.

Figure 8 shows that the assay retention results of the ECTF and WWP incised 4x4 lumber failed to meet the 0.25 pcf requirements of CSA O80.2 and the proposed CSA O80.32-YY standards. The ECTF incised lumber resulted in 80% higher assay retention than the WWP incised lumber.



Conclusion

The ECTF incised 2x8 and 4x4 Western SPF lumber resulted in a higher treatment quality than the WWP incised lumber. Overall, the ECTF incised lumber resulted in deeper NW₁₀₀ penetrations and higher NW₁₀₀ assay retentions due to deeper incisions and higher incision densities. The ECTF incised 2x8 lumber met the 10 mm penetration and 0.25 pcf assay retention requirements of CSA O80.2 when sampled randomly from the edge. Although none of the 4x4 lumber met the penetration and assay retention requirements of CSA O80.2, the ECTF incised 4x4 resulted in 119% higher NW₁₀₀ penetration and 80% higher NW₁₀₀ assay retention than the WWP incised 4x4.



Appendix 1



Photo 1: Spacing Gaps on the Surface of WWP Incised 2x8 Western SPF