Norbord

19/32 SIP Fastener Withdrawal
(Exploratory Experiment)

March 2019
SIPA Conference, Phoenix AZ
New 19/32” OSB Facer

- Background
  - Norbord was approach to provide panel testing information to support SIP panel introduction in Florida.
  - Norbord Alabama plant submitted 19/32” OSB for PR-N612 testing (tension, bending strength and stiffness)
  - Porter Corporation has provided SIP panels made using 19/32 OSB to conduct screw and nail withdrawal testing.
Experimental Factors

- Test 3 Types of Fasteners:
  - Roofing Screw
  - 1-1/2 Ringed Nail
  - 2-1/2 Common 8d Nail
- Test 2 SIP panels
  - 19/32 Plywood
  - 19/32 OSB
Experimental

- Test 3 Conditions (Insertion - Condition - Withdrawal)
  - Dry-Wet-Redry
  - Wet-Redry
  - Dry-Dry
- Number of Replicates: 10
Impact of Fastener Type on Withdrawal Strength

- There is enough evidence to conclude that there are differences among the means at the 0.05 level of significance for the three (3) Fasteners (One-Way ANOVA).
Impact of Soaking the SIP Panels as per ASTM D1037

- There is enough evidence to conclude that the “Dry-Dry” condition is higher strength for the “8d Nail” and the “ringed nail” (One-Way ANOVA).

*Fastener Withdrawal for the Various Conditions*

*95% CI for the Mean*

Individual standard deviations are used to calculate the intervals.
Faster Withdrawal for Various SIP Facers

- The “Dry-Dry” fastener withdrawal means are different when comparing OSB and Plywood (2 Sample t-Test).

![Graph showing fastener withdrawal strength under dry-dry condition](image)

*Individual standard deviations are used to calculate the intervals.*
Faster Withdrawal for Various SIP Facers

- The “Dry-Wet-Redry” nail withdrawal means are not statistically different” when comparing OSB and Plywood (2 Sample t-Test).

*Individual standard deviations are used to calculate the intervals.*
Faster Withdrawal for Various SIP Facers

- The “Wet-Redry” nail withdrawal means are not statistically different” when comparing OSB and Plywood (2 Sample t-Test).

![Graph showing fastener withdrawal strength under wet-redry condition.](image)
Conclusion

- The type of fastener has a significant impact on the withdrawal strength.
- Once the sip facer is wet (before or after nail insertion), the nail withdrawal strength will be lower.
- The nail withdrawal values for 19/32 SIP plywood and 19/32 SIP OSB are similar to the values reported for raw panels (APA Report T2001-3A, Zhaozhen Boa)