



**CALIFORNIA SCIENCE & ENGINEERING FAIR  
2018 PROJECT SUMMARY**

<b>Name(s)</b> <b>Michael P. Bedrosian</b>	<b>Project Number</b> <b>J0304</b>
<b>Project Title</b> <b>Comparing the Compression Strength of Reclaimed Wood Structures to New Wood Structures</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective of this study is comparing the compression strength of reclaimed wood structures to new wood structures. My goal is to prove that reclaimed wood structures will be stronger than new wood structures. Also with an emphasis on recyclability of reclaimed wood as a building structure material.</p> <p><b>Methods/Materials</b> Purchased reclaimed Douglas fir and Redwood from Crossroads Lumber Co. Purchased new Douglas fir and Redwood from Holt Lumber. Holt lumber fabricated all wood planks to spec. A total of 28 planks for each wood type were made. Planks nailed together by National Raisin Co. Forman, to form a rectangular open ends box. Seven boxes of each wood type were made. Box measurements were 7" long, 3 1/2" wide, 5/8" thick. The boxes were tested in a Universal Compression Machine at Fresno State Univ. Engineering Dept. Structure placed in compression machine until broken. Compression results recorded for each wood type. PSI calculated, and compression wood average results charted.</p> <p><b>Results</b> The results of my investigation shows that reclaimed wood structures are stronger than new. Reclaimed Douglas fir compression strength average was 567 PSI vs. 464 PSI to new. An 18% compression strength difference in reclaimed Douglas Fir to new. Reclaimed Redwood compression strength average was 345.5 PSI vs. 289.9 PSI to new. An 16% compression strength difference in reclaimed Redwood to new. The results further prove that my hypothesis is correct that reclaimed structures are stronger than new. This gives builders a recyclable option to use reclaimed wood.</p> <p><b>Conclusions/Discussion</b> I found that my hypothesis is correct that reclaimed wood structures are stronger than new. Reclaimed Douglas fir structures were 18% stronger than new which was very significant. Reclaimed Redwood structures were 16% stronger than new which was very significant as well. Consistently reclaimed wood proved to be stronger in both wood types. Reclaimed wood can be used more for building projects for its strength and appearance. Only 15% of reclaimed wood is used, rest goes to landfills. Let's try to utilize this precious resource better!</p>	
<b>Summary Statement</b> Compression testing of reclaimed wood structures proved to be stronger than new wood structures which was very significant and a viable building option.	
<b>Help Received</b> Dr. Kimberly Stillmaker, Assistant Professor Civil Engineering Department, California State University Fresno; Mr. Mar Mandel Owner, Crossroads Recycled Lumber Company, North Fork; Mr. Santos Garcia Lumber Supervisor, Holt Lumber Company, Fresno; Mr. Frank Reyna Yard Foreman, National Raisin	