# Highly Effective Hybrids

Louw, Danika

Research and development on new forms of construction are important to the growth of infrastructure and manufacturing. Finding new materials that can not only be more cost effective than commercially used beams, but also sturdier, stronger, and environmentally friendly will help create a new reliable source for the growth of society and the economy. Can a hybrid composite laminated beam designed from the addition of fiberglass, an environmentally friendly material, and the strongest woods under tension and compression be more efficient than commercially used beams? A composite laminated beam subjected to a point load made out of three pines on the top, maple, and fiberglass on the bottom will be stronger and more cost effective than laminated wood beams alone. To evaluate, find the tensile strength of fiberglass using a tension testing machine. Then, use a beam bending machine to test the composite laminated beams. Press the beam with increasing force. Document at which force the beam fails and measure the distance between the bolt head and the nut. Evaluate the strength, cost, deflection, and stability of the beams to determine the most efficient solution. After testing, it was found that hybrid composite laminated beams were stronger and provided a good cost compromise compared to conventional pine beams or laminated wood beams alone. This experiment can help build stronger environmentally friendly beams that won't buckle or snap under the pressure of a building and be more cost effective to buy and manufacture due to less material being needed for construction.

**Awards Won:**

Fourth Award of $500