
Small-Diameter Roundwood Engineered Trusses—A First!

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Building with round logs is not a new concept. Our ancestors used large-diameter roundwood (larger than 10 inches) to build their dwellings. These structures required a lot of labor to build and used wood inefficiently. Today, structures built from small-diameter roundwood (smaller than 6 inches) have new fastening systems and connections and are engineered to meet performance specifications.

The new 5,000-square-foot library in Darby, MT, (figure 1) is a demonstration of a structure built with small-diameter roundwood. Partners in this project included the Forest Service; Montana Community Development Corporation; Porterbilt Co., Inc.; Friends of the Darby Library; Bitterroot Rural Conservation & Development; Beaudette Consulting Engineers; and architect Ron LaRue.

The structure includes small ponderosa pine logs as trusses, columns, and



Figure 1—Interior of the new library in Darby, MT, that uses small-diameter roundwood.

parallel cords. Small-diameter roundwood logs are visible under the eaves and throughout the interior. The ceiling is made of blue-stain pine, wood that is often discarded because of the discoloration. The blue stain is caused by a fungus that does not weaken the wood. Some persons find that the blue pattern in the wood makes it more attractive.

Logs used in the round form:

- Retain their strength
- Resist warping
- Maintain dimensional stability
- Minimize processing costs
- Help offset the cost of forest restoration

A variety of softwood species can be used in roundwood construction; hardwoods are also an option. A very weak species of wood might require slightly larger members, especially if snow loads are high.

When small-diameter roundwood is used for structural uses, data are needed regarding log properties and grading. Engineering properties now are assigned to round timbers graded by visual techniques that were developed for large-diameter logs. Little data are available to demonstrate how well these visual grading techniques predict the properties of logs that are 4 to 7 inches in diameter.

However, research is underway to evaluate the applicability of visual and mechanical grading techniques for logs from small-diameter ponderosa pine and Douglas-fir trees. Cooperators in this study are Dr. David W. Green, research engineer at the Forest Products Laboratory; Dr. Thomas Gorman, University of Idaho; and the Timber Products Inspection Service, Vancouver, WA.