Engineered Wood

(Definitions and PMHI Specification Policies)

Engineered Wood (EW), also called composite wood, "man made wood" or "manufactured wood", includes a range of wood products which are manufactured by binding together the strands, particles, fibers, or veneers of wood, together with adhesives, to form composite materials. These products are engineered to precise design specifications which are tested to meet national and international standards.

At PMHI, we are seeing most engineers specifing EW in lieu of conventionl solid sawn lumber for all major beams, headers, and even some posts. Since there are now several competing and interchangable forms of EW, the purpose of this paper is to clarify the common types of EW and PMHI policies of supply.

Each definition includes a strength comparison to the other common EW products. Likewise, a cost factor is included to help compare the product cost to a solid sawn beam of equal size.

Glue Laminated Beams (Glu-lam)

An engineered timber product manufactured by gluing together individual pieces of dimensional lumber which have been finger jointed end-to-end to obtain longer lengths.

Glu-lam beams can span a much greater distance than with solid sawn timber and, but are not as strong as PSL, LVL or Big Beams.

Cost Factor: 2.76

Laminated Strand Lumber (LSL)

LSL is made of chopped wood strands. Even though it looks like Oriented Strand Board (OSB), the strands in LSL are up to 12 inches long while OSB strands are only up to 6 inches long. Also, LSL strands are oriented parallel to each other while OSB strands are randomly oriented. The wood used is either fast-growing aspen or yellow poplar and as much as 75 percent of a log can be utilized. The strands are dried and treated with a polyurethane resin. The strands are then pressed into solid billets up to 64 feet long, with thicknesses up to 5-1/2 inches, and depths up to 48 inches.

Truss Joist LSL lumber is marketed under the trade name of TimberStrand®, but is no longer a proprietary product. Louisiana Pacific (LP) will have their “SolidStart” LSL products on the market this spring.

LSL is a good choice for short-span headers. It's also used in the production of engineered studs, plates, posts, and rim joists. In general LSL strength values compare to Glu-Lams. Hence, LSL is not as strong as PSL, LVL or BigBeams

Cost Factor: 3.31

Parallel Strand Lumber (PSL)

PSL is a proprietary product of Truss Joist MacMillan and is marketed under the registered trade name of Parallam®. PSL beams are made from lower-grade, defect-laden wood veneers. The Doug fir, southern pine, or yellow poplar veneer is chopped into 1-inch by 8-foot-long strips and bonded parallel to one another to create a structural wood product that is superior even to dimension lumber milled from old-growth timber. PSL is available in dimension up to 11 x 17 inches and length up to 66 feet. With the unique parallel grain of PSL it can be left exposed as a design element.

PSL beams have strength values equal to LVL and Big Beams.

Cost Factor: 3.93

Laminated Veneer Lumber (LVL)

LVL is made from lower-grade Doug fir, southern pine, aspen, or popular veneers taken from the outer layers of the logs. LVL is similar in appearance to plywood but, unlike cross-laminated plywood, its plies are all oriented parallel to one another. The plies are bonded with exterior exposure adhesives into billets up to 7 inches thick, then cut into standard widths up to 18 inches.

LVL beams have strength values equal to PSL and Big Beams. Their only disadvantage is they are not as “pretty”.

Cost Factor: 3.39

Big Beam (BigBeam)

BigBeams are a proprietary product of the Roseboro Corporation. BigBeams are fabricated with a dimensional lumber “core” (just like a glu-lam). Then an LVL component is laminated to the top and bottom.

Even though a Big Beam may look like a glu-lam their strength values are far greater and are equal to those of a PSL or LVL.

Cost Factor: 3.38

Conclusions & PMHI Policy

PMHI will primarily supply LVL or BigBeam beams in lieu of any specified PSL beam EXCEPT for posts. If a PSL post is specified, we will supply a PSL since there are not LVL or BigBeams in PSL post dimensions.

Since the LSL makes the most efficient use of the raw log materials and can be fabricated from smaller fast growing trees, and LSL stock is readily available and will become even more price competitive with multiple manufacturers this spring, LSL framing should be considered for “Green Construction” over FSC lumber that is more costly and not readily available.